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FOR QUARTER CENTURY THE BRICKBUILDER

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JUNE 1917

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Published Monthly by

ROGERS AND MANSON COMPANY

85 Water Street, Boston, Mass.

Advertising Department, 42 West 39th Street, New York

Yearly Subscription, payable in advance, U. S. A., Insular Possessions and Cuba $5.00
Canada $5.50 Foreign Countries in the Postal Union 6.00
Single Copies 50 cents All Copies Mailed Flat

Trade Supplied by the American News Company and its Branches. Entered as Second Class Matter, March 12, 1892, at the Post Office at Boston, Mass.

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RUE DE NAMUR, LOUVAIN, BELGIUM, SHOWING RUINS OF UNIVERSITY LIBRARY

AFTER AN ETCHING BY GEORGE T. PLOWMAN

Louvain was one of the first Belgian cities destroyed by bombardment and fire. It is located near Brussels and was noted for its ancient buildings, particularly the University Library, shown at the left, and the Gothic Hotel de Ville, fortunately spared, of which a turret is shown in the background.

THE ARCHITECTURAL FORUM

FOR QUARTER CENTURY THE BRICKBUILDER

VOLUME XXVI JUNE 1917 NUMBER 6

The Plan and Construction of Military Hospitals

By CHARLES BUTLER

THE term "War Hospital" covers a multitude of varying types of building with varying destinations, from the hole in the ground in the front line trench to the great physical re-education centers in the rear, and includes canal boat, railroad train hospitals, hospitals for contagious diseases, rest camps, etc.

The hospitals, however, to which I refer especially in the present article, are those for the general care of wounded and sick, and it may, perhaps, be easiest to classify them by their geographical relation to the front. I speak, I may say, entirely of the French front, as my experience at the British front is extremely limited.

I should perhaps preface my remarks with an explanation of just what my relation to the French army was, and how I happened to have the opportunity to gain some knowledge of French War Hospitals.

As a member of the American Relief Clearing House I was at work in Paris in the fall of 1915 when Dr. Carrel, who knew of my having made a special study of hospital planning in America, asked me to prepare for him the plans for a small 100-bed unit, to be erected closer to the front than his hospital at Compiègne, then under shell fire and likely to be evacuated any day.

Administration difficulties in regard to the admission of foreign nurses to the advanced zone of the army prevented the erection of this hospital, and the destruction of the 380 mm. gun which was shelling Compiègne ended the necessity of evacuating, so the project was dropped; but the Deputy Minister of War in charge of the Medical Service (there are three assistant Ministers of War in France for Munitions, Supplies, and Medical Service) expressed his interest in the plans and asked me to bring them to him. It turned out that it had been planned to hold a competition for a model portable house type of hospital to be erected near Paris and to serve as a type for future base and home hospitals; but after looking over our plans the minister remarked that a competition did not seem necessary, and I volunteered my services to work out this model plan. A very excellent site was selected just outside the Bois de Vincennes, the great park to the east of Paris corresponding to the Bois de Boulogne on the west. At my request, M. Pellechet, a former fellow student at the Ecole des Beaux Arts, was to his considerable annoyance dug out of his second line trench and brought back to help me on the work. Dr. Dumont, a prominent young civilian surgeon, similarly mobilized for the war, was shortly after added to our combination, and we three working together have since very considerably influenced the design of French War Hospitals.

All France is divided into two parts, the army zone—and the rest. The zone is a strip, on the average, 30 miles wide, parallel to the front, into which one only penetrates by the permission of the Grand Quartier Général. In this zone lie the front line hospitals, ambulances, dressing stations, etc.

The grouping of these services is about as follows: In the front line trench is what is known as the *Abri du Blessé*, a hole in the side of the trench, where the wounded man is put to get him as much as possible out of danger till he can be moved to the advanced dressing stations which lie 50 yards or so behind the front line trenches. This dressing station or *poste de secours* is presided over by an assistant surgeon, probably a medical student when war began. From the dressing station, which is always underground and contains perhaps a dozen bunks, the wounded man is transported, as soon as the firing slackens sufficiently, through the *boyau*, or communication trench (*boyau* means bowel, and the convolutions of the communication trench for the purpose of localizing the effect of bursting shells fully justify the name), back to the battalion dressing station, perhaps a mile away.

You can imagine just how painful is the trip through this mile of winding trench. Various types of stretchers are used, perhaps the most satisfactory being the hammock stretcher hung from a pole carried on the shoulders of the bearers and more easily maneuvered in the winding trench than the ordinary side pole stretcher. There are also chair stretchers for seated cases, etc.; but any way you take it, it is a hard trip for a wounded man. At the battalion dressing station is a full fledged surgeon and there are facilities for operating—as always underground. This dressing station is generally accessible for motor ambulances, at least at night.

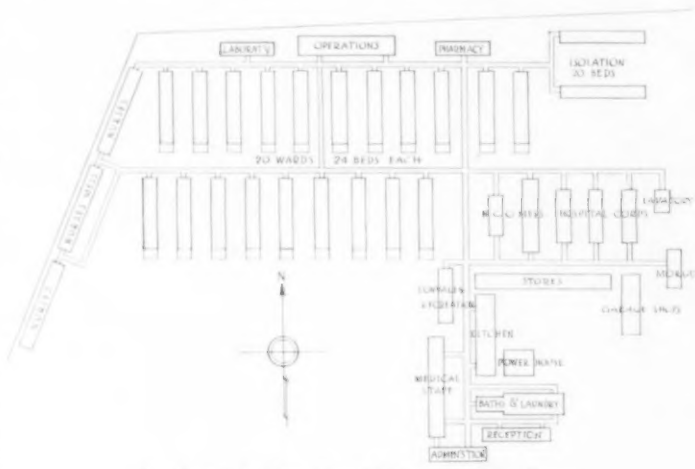
The advanced dressing station is located so that one end is in direct communication with the *boyau* through which the wounded are transported. It is underground and fairly heavily protected and contains beds in two tiers, with a small space at one end for emergency dressings and stores. The wounded reach this post in about six minutes, and from there are carried in ordinary stretchers about a mile to the end of the military road, the farthest point to which ambulances can go.

These subterranean posts are made about 10 feet wide at the ceiling, with walls of planks sloping slightly in toward the floor. Log posts support the roof and are spaced about every 5 feet.

The lower beds are for the more seriously wounded, the upper ones for slightly wounded. The former are

removable for cleaning; the latter hinged at one end to allow swinging for cleaning. The construction of the roof is interesting in showing the provision made for exploding shells. An explosion chamber is built immediately above the ceiling over one layer of logs. Above the chamber there are generally at least four layers of logs, each layer placed crosswise of the preceding one and large stones and earth above these to a depth of at least 5 feet. For absolute protection against shells up to and including 220 mm., experience has shown that 15 feet should be provided. Against 380 mm. and 420 mm. shells, experience has as yet shown no satisfactory method of insuring protection.

The battalion dressing stations are located underground and heavily protected from shell fire. They contain an operating room at one extremity, provided, as always, with two exits. Beds in two tiers accommodate about twenty-four wounded. Living quarters for orderlies, surgeons, etc., are provided above ground. The wounded arrive at these stations in about one hour from the front.



Plan for 500-Bed Base Hospital, Vincennes, Paris, France

The next station, called an ambulance, is located about two miles from the front and comprises a number of buildings underground. The operating room is about 8 by 17 feet, with an arched roof of corrugated steel, the crown of which is about 7 feet 4 inches above the floor. The haunches of the arch are filled with earth up to the level of the crown, above which is a thin layer of cement and a course of tree trunks about 8 inches in diameter. Above these is the first explosion chamber about 20 inches high, again two or three courses of logs, another explosion chamber and additional logs covered with earth and rocks, making a total thickness from crown of arch to the surface of about 12 feet.

The explosion chambers are designed to counteract the effect of the type of high explosive shells which are fitted with a delayed fuse that, ignited by impact, allows the shell to penetrate the earth before exploding.

The operating room is reached by a *boyau* leading from an examination room, also underground with heavy protection, and placed at the edge of the road by which the ambulances arrive. From the operating room another *boyau* continues to a waiting space, where, after having their wounds dressed, those who are to go to the hospitals can wait in security for the ambulances to carry them away.

This description might be extended to greater length, but will serve to give a fair idea of the dressing stations and ambulances lying in the advanced zone, the first two or three miles back from the front, where shells may always be expected and danger is at all times present.

The French Medical Corps has devised a most ingenious unit for use in connection with these ambulances — what is known as the Ambulance Chirurgicale Automobile. This consists of a unit construction portable building, comprising a waiting room about 10 by 16 feet, a sterilizing room about the same size, and an operating room about 20 by 16 feet, all of which can be packed on two motor trucks. Another truck contains a very complete sterilizing outfit, a fourth the X-ray equipment with electric generator, while the fifth serves for general supplies and transport of personnel. These buildings are now being erected with double walls and steam heat, and can be quickly transported to the point on the front where they are most needed.

We now come to the field hospitals lying a little farther back, and in which men can be cared for who need a few days' treatment before being sent on to the rear. They are a cross between the ambulances and the base hospitals and are either in existing buildings, in tents, or in portable barrack buildings, but more and more in barracks and with more and more of the conveniences and comforts of the base hospital.

Back of the field hospitals lie the great centers such as Revigny and Bar le Duc to the rear of Verdun, Belfort in Alsace, Bray and Amiens in the Somme, where the wounded are counted by thousands instead of by hundreds, and where the final sorting out is done.

At Bray, which I visited in October, the group contains 3,500 beds, divided into a hospital of 1,000 beds for the seriously wounded who are not transportable, a *dépôt d'éclopés* of 1,000 beds for the slightly wounded and slightly ill, and an evacuation hospital of 1,500 beds for those who are to continue to the rear on hospital trains. The hospital proper is of the unit construction, portable house type, equipped for giving first class surgical treatment.

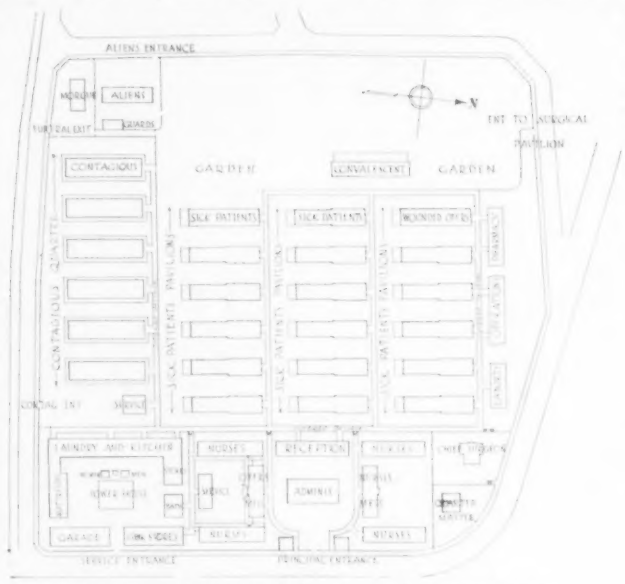
It was a hospital of this type which I was asked to design to be erected as a model just outside of the gates of Paris.

This plan will serve to show the special requirements of War Hospital planning. They are in relative importance as follows:

1. Reduction of road building to minimum.
2. Complete intercommunication between buildings by wheeled cars. Patients, food, linen, and supplies of all sorts are carried on wheels, and all buildings must be connected by galleries uninterrupted by steps.
3. Grouping of wards for easy service and with proper north-south orientation, and south end unobstructed.
4. Grouping of administration, technical and general services for easy communication and supervision.
5. Grouping of dwellings for staff, nurses, and orderlies for convenience and supervision, and with sufficient separation from patients' quarters.

Although, as a result of certain governmental changes, the plan for the hospital at Vincennes was never executed, it has served as the basis for the plans of many other hospitals to be built all over France, which were submitted for criticism to our committee.

An interesting development of the work of our committee is the plan for the permanent military hospital at Issy les Moulineaux. For this hospital complete plans had been prepared and approved just before war broke out; but as a result of the modifications caused by war experience, we were asked to completely replan the hospital, which in its general scheme of arrangement follows the war hospitals, but is executed in permanent materials.



Permanent Military Hospital at Issy les Moulineaux, France

On my return to the United States last winter I was asked to assist the Committee of Directors of Red Cross Base Hospital Units of New York, and the following plans for typical base hospitals show the result of our work in France as adapted to American requirements.

The site selected is assumed to be on the south side of a road, with the ground sloping slightly toward the south. The grouping of administrative and technical services around the ambulance court and the general services around the service court are to be noted, with the orderlies' quarters at the east and the nurses' and doctors' quarters at the west. The only road building required is in the two courts, while the wards lying to the south are connected to the administrative and service buildings and dwellings by covered wooden walks.

The wooden slatted walkway, covered or uncovered, is as much of a necessity in a war hospital as it is in a trench, as mud is the bane of the front, and the slat walk which permits of its elimination, so far as the interior of the hospital is concerned, is invaluable, and as all differences of level are taken up by ramps in place of steps, every part of the group may be reached by food trucks, wheel stretchers, and chairs.

The details of the plans follow in general the ordinary practice, with the necessary modifications to fit military needs. The reception building in its present form is, however, a very definite product of the war. As it must be assumed that every wounded man is filthy, even though not necessarily vermin infested, it is essential that he be thoroughly cleaned before being admitted to the ward. The need of storage rooms for men's uniforms, boots, underwear, etc., and the necessary space for clean linen, surgeons' and clerks' offices, has led to the plan shown on the next page.

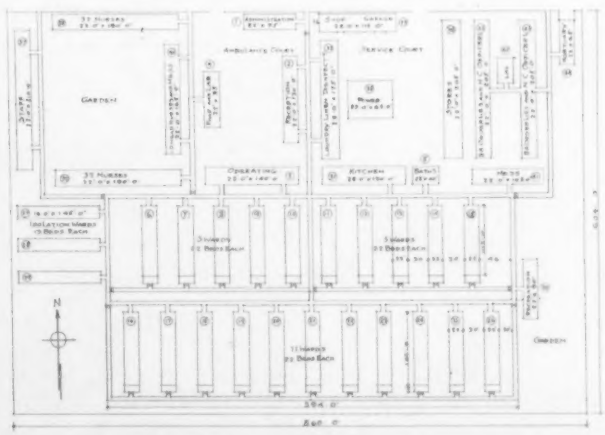
In the center is the receiving room into which the ambulances discharge their loads. In this room the surgeon on duty makes a hasty examination, picking out those most needing prompt transport to the wards. They are then taken in order into the wash room, where their pedigrees are taken, their valuables checked, and where after receiving their ward assignments they are cleaned in the table baths, put in clean hospital clothes, and wheeled away to bed, while their soiled clothes go to the disinfecting plant.

After being washed, disinfected, and repaired, their effects return to the building for storage, where their records and valuables are also kept. When the wounded man is finally convalescent, and ready to be discharged, he comes back to this building, turns in his check, and receives his uniform and personal possessions and, after signing off, is discharged. The advantage of concentrating in one building the receiving and discharging of patients, together with the filing of their records and the storage of their effects, is obvious.

The administration building contains the usual general waiting room and offices, but is considerably less important than the corresponding service in a civil hospital.

The operating pavilion is naturally of especial interest in a war hospital. The plan shows two entrances — one being reserved for patients, while the other permits the orderlies to reach the dressing preparation room and secure their provision of sterilized dressings for the wards, without penetrating into the rest of the building. Other points to be noted are the two operating rooms, the larger planned to accommodate three tables if necessary and the smaller reserved for uninfected cases.

Easy access is afforded to the plaster and X-ray rooms by the corridor 7 feet wide. It is to be noted that for the operating pavilion, the 20 or 24 foot unit, used for most of the buildings, is insufficient, and the 28 foot unit has therefore been adopted for this building, as well as for kitchen and laundry.



General Plan for Base Hospital Adapted to American Conditions
Butler & Rodman, Architects

The pharmacy and laboratory building presents no peculiar features.

The plan of the kitchen is of interest, with its space reserved for the food cars adjacent to the scullery, all dishes being kept in the building between meals and the cars being loaded at a counter which extends the full length of the bakery and kitchen proper and serves as a barrier to prevent the orderlies from entering either room. The main entrance for supplies is on the court side of the building, with an office for the receiving clerk and vegetable and grocery storage, refrigerators, meat room, and vegetable preparation room.



Reception Pavilion



Operating Pavilion

In view of the fact that much of the linen and clothing is contaminated, the laundry has two receiving rooms, — one for ordinary soiled linen and one for linen, clothing, mattresses, etc., requiring sterilization; these pass either through the sterilizing washer or the steam and formaldehyde sterilizer into the laundry proper, where they join the other linen and are thenceforth treated no differently from the rest.

The storage space for mattresses and pillows and for clothing awaiting condemnation should also be noted, and the size of the repair room and general storage rooms, also the distribution counter in this last room, which prevents orderlies coming with their requisitions for clean linen from entering the storeroom.

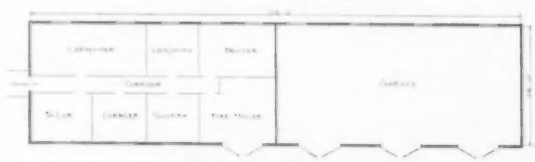


Administration Pavilion



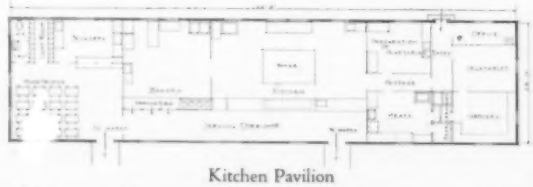
Pharmacy and Laboratory

The ward buildings, containing each twenty-four beds in the open ward and one in an isolation room, show the consistent development of the war hospital toward the standards of civil practice.

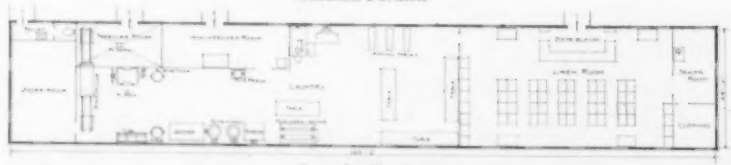


Workshop and Garage

Base hospitals are being planned more and more with sewage disposal systems, and in the case in point complete service is provided with toilets, bed pan and housemaids' sinks, lavatories, kitchen sinks, etc. As relatively few wounded can be bathed in the ordinary tub there are no bath tubs in the ward buildings, but instead a small central bathhouse is provided, thus materially reducing the expense. An isolation room is provided in each ward unit, also a surgical dressing room, diet kitchen, and nurses' office and linen closet.



Kitchen Pavilion



Laundry Pavilion



Storage Pavilion

Following the custom of civil hospitals the wards are oriented north and south, and the south end is composed entirely of windows so as to permit the greatest possible amount of sunlight to enter. At this south end is placed, on a level with the ward, a terrace, on to which the beds may be wheeled in clear weather, for experience has shown that fresh air and sunlight are as good for wounded as for tubercular patients. The beds must therefore be provided with large rubber tired casters to permit easy rolling.

A large recreation building is provided, which may also serve as convalescent mess — it must be borne in mind that in the average war hospital there are many men who except for a local wound are quite well and active, who would be difficult to handle if provision were not made for their distraction in a building specially set apart for this work, usually divided into reading room and room for games.

The French authorities have solved the problem of drinking by providing a canteen, at which each convalescent patient may buy drinks to the extent of one drink per day — a simple method when there is but one source of supply. No treating is allowed.

The isolation buildings are designed merely to care for contagious cases which may develop in the hospital, until such time as they may be evacuated to the contagious hospitals.

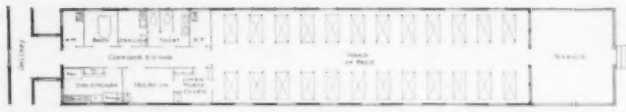
Individual rooms or cubicles are provided for the medical staff and for the nurses, while the orderlies are grouped in dormitories.

Almost as important as the planning of a base or field hospital is the choice of materials and type of construction, and here we have much to learn from the experience of our Allies. On the British and French fronts portable house unit type construction is employed almost to the exclusion of other types, the theory being that these buildings will pretty cer-

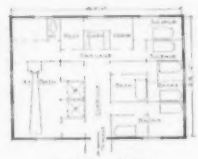
tainly be moved at some stage of their career; there is also the thought that the unit construction building may be of service after the war for temporary use in the regions so completely devastated in France and Belgium. Portable house construction is not used with the idea that hospitals will be taken down and reërected in three or four hours, as some manufacturers claim for these buildings; but it does seem advisable to use a type of building which may be transported and reërected if desired.

The English, French, and Belgians have all worked out types of buildings which are far superior in their practical workableness to any of our types; this is natural, in view of the fact that these countries are erecting buildings of this type not by hundreds, but by thousands, but it would be well if we could learn from their experience and avoid their mistakes. A very striking characteristic of the types used abroad is the small size of structural timbers. Europe has never had the immense timber supply which we have been for years wasting, and has always been economical; and the further fact has been realized that it was not necessary to design buildings which should have a life of a generation—on the contrary, all that was needed was a building which could last five or six years; floors are calculated not for stiffness but for strength, and all sections are reduced; 1½ by 3 inch floor joists, 16 inches on centers, with span of 5 feet, are used in one system, and studs are two inches square.

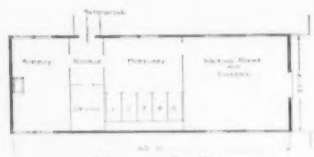
In all of the European systems, after experiment-



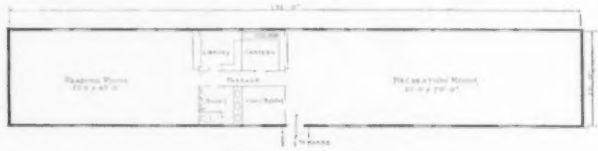
Ward Pavilion



Bath Pavilion



Mortuary Pavilion



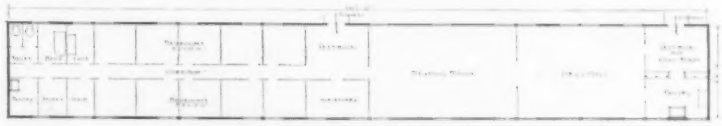
Recreation Pavilion



Isolation Pavilion



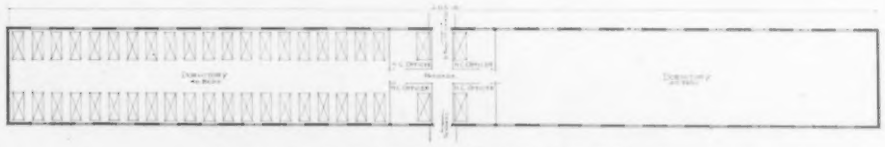
Orderlies' and Non-Commissioned Officers' Mess



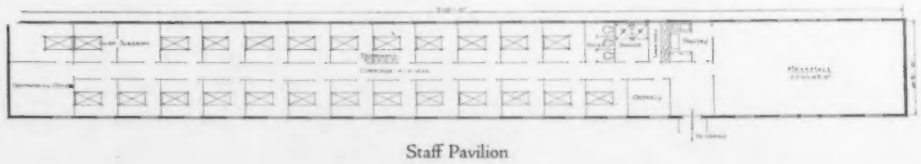
Head Nurses' and Mess Hall Pavilion



Nurses' Dormitory Pavilion



Dormitory for Orderlies and Non-Commissioned Officers



Staff Pavilion

ing with single walls, the double wall with an air space has been adopted as being an absolute necessity for hospital wards.

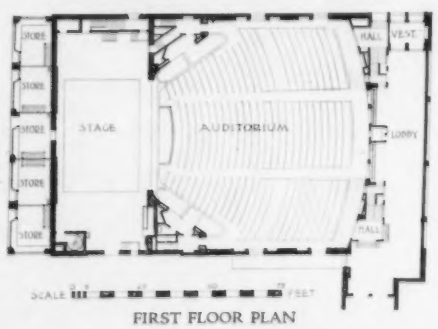
While in general these buildings are heated by stoves, in many steam heat is being installed; some have plumbing, and all electric light. A necessity for wooden buildings is an efficient layout of water supply to hydrants in ample number, for the buildings will burn quickly.

EDITORS' NOTE.—Some confusion of terms seems to exist concerning branches of war hospital work, and a brief explanation may be of service. The military units which the Red Cross is authorized by the War Department to create are base hospitals, hospital units, surgical sections, and general hospitals. The work is divided into three zones: the first being the service at the front; the second, the military base to which the wounded are brought and where, in the *base hospital*, the first complete equipment is found; the third, the home country, where military hospitals, called *general hospitals*, are created from existing civil ones. Hospital units are organized groups of physicians, nurses, etc., assigned to military hospitals or hospital trains and ships. Surgical sections are special detachments to reinforce the operating staffs in time of emergency, and consist of four surgeons, seven nurses, two orderlies, and a clerk.

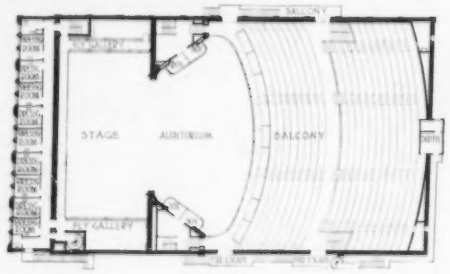
The hospital units, surgical detachments, and base hospitals are movable units, each with individual equipment, and available for service wherever the government may designate.



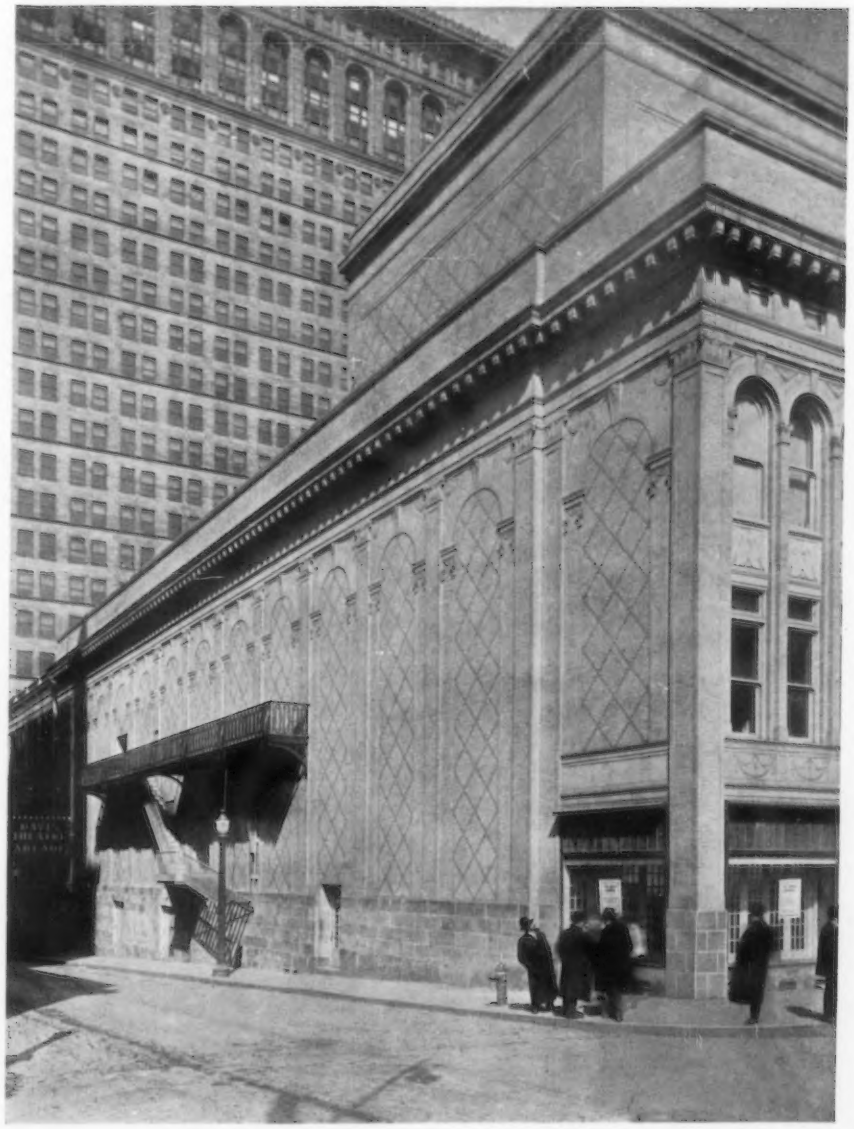
VIEW OF BOXES AND BALCONY FROM STAGE



FIRST FLOOR PLAN



BALCONY FLOOR PLAN



SIDE VIEW OF EXTERIOR

DAVIS THEATER, PITTSBURGH, PA.

H. E. KENNEDY CO., ARCHITECTS

The Motion Picture Theater

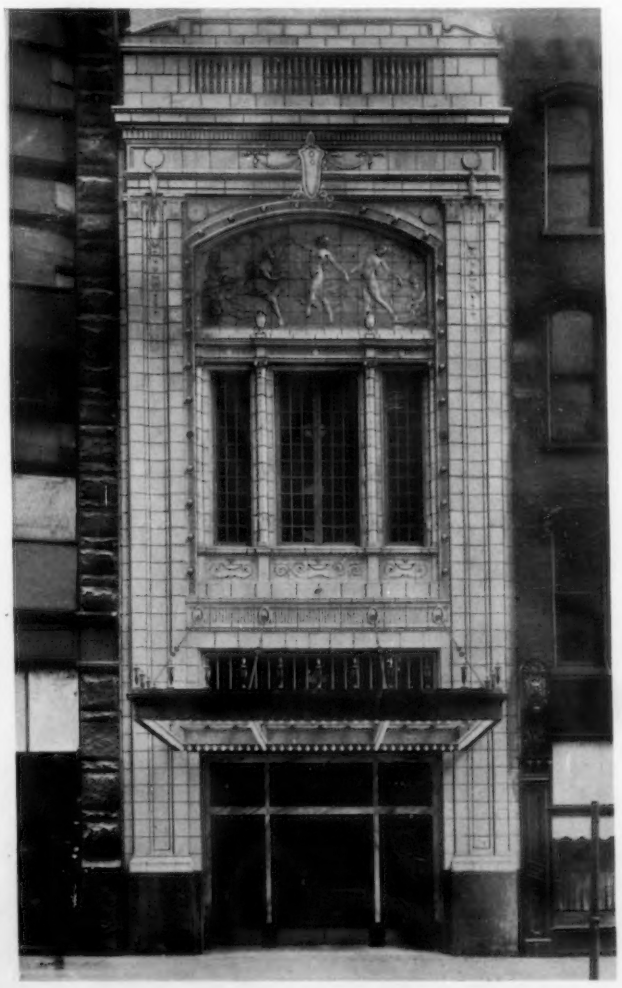
I. COMPARISON OF TWO TYPES OF PLAN

By CHARLES A. WHITTEMORE

THE motion picture theater of to-day bears very little resemblance to the type which was developed soon after the "movies" became a popular form of entertainment, and the motion picture theater of to-day may possibly develop into as obsolete a type as the picture theaters of ten years ago are now. With the development of projecting machines, with the development of pictorial subjects, with the development of the art of photography in motion pictures, and with the advent of good color photography which in motion pictures is likely soon to be developed, there have been corresponding changes in the character of the theaters themselves.

About eight years ago a building was being remodeled for a motion picture theater. The owners were spending approximately $20,000, while the seating capacity was only 325 seats. The owner of a competing picture theater then in operation made the statement that the people who were investing so much money in a motion picture enterprise were very foolish, as the life of the motion picture business was then limited, in his mind, to a period of three to five years longer. How inaccurate his guess was, we all know, and as in the science of electricity so in the science of motion pictures — the surface of the subject has been barely scratched.

Originally motion picture theaters were developed from stores which were vacant or were obtainable on a short term lease at little expense. In places of this character the entertainment was carried on, although the conditions were far from ideal either as to projection or comfort of patrons. From this small beginning the business has developed to such a point that at the present time there are in contemplation plans for theaters to seat in excess of 10,000 people. This to us at the present time may seem to be the ultimate limit, and still with the new developments possible in the field it is not unreasonable to think that theaters of even greater seating capacity than 10,000 people will make a profitable investment.



Street Facade of Corridor Leading to Davis Theater

Motion picture theaters may be roughly divided into three general classes: first, the "store show," or the picture theater which is made in the course of remodeling a store property; second, the type which has come to be known as the "bleacher" type (Fig. 1); and third, the legitimate theater type (Fig. 2). Either of the latter types may or may not have a fully equipped stage.

With the first type we need not concern ourselves, as there is nothing in its construction which requires much study. A comparison of the second type with the third shows some very interesting phases of the problem. This type, as illustrated in Fig. 1, shows the motion picture principle adapted primarily to inexpensive property, such as suburban property, or where the maximum seating capacity with the least possible cube of building is desired.

It will be noticed that in this type there is no balcony or gallery, but that the floor from the orchestra pit to the back row of seats is practically one continuous sweep. The rear section, as will be observed, is raised at a faster pitch than the usual gradients allowed in aisles, in order to accommodate lobbies, vestibules, foyers, coat room, check room, etc., underneath.

In this plan the entrance to the auditorium comes approximately in the center of the interior, so that all seats throughout are equally accessible. The entrance from the street to the lobby may or may not be in the center.

A comparison of the cube of the type illustrated in Fig. 1 and that in Fig. 2 will, without doubt, be interesting to those who have never considered the differences between the two developments. In Fig. 1, for instance, the theater proper covers 8,900 square feet on the ground and has a seating capacity of 1,400 seats. The total cubical contents, including the basement under the stage and the stage, as well as the entrance lobbies, etc., is 429,500 cubic feet, which is approximately 193 cubic feet per seat. Fig. 2 has a seating capacity of 1,400

seats also. The area in this particular case is 9,500 square feet. The cube is 736,000, and the cubic space per seat is 527 cubic feet. The cost of the theater as indicated in Fig. 1 is approximately $70,000, including the seats and equipment, or at the rate of $50 per seat. The cost of the type shown in Fig. 2 is $237,000, or $170 per seat. Both theaters are furnished with a completely equipped stage of the same general character, the seats are of the same general type, and the equipment throughout is almost identical in so far as relates to the various parts included in the theater construction. It will be seen, therefore, that Fig. 1 shows not only the same seating capacity at a very much less expense, but also an infinitely better auditorium from the standpoint of acoustics, ventilation, and sight lines.

The type shown in Fig. 1 also has an additional advantage in that the administration is very much simplified, requiring fewer attendants and affording greater ease in handling the patrons. In case of an emergency the entire audience in Fig. 1 could be discharged from the house probably in less than three minutes, while in the case of Fig. 2 it would be some considerable period before the last patron in the audience would be able to find an exit to the street. This is not, however, to be construed in any way as an argument against the type shown in Fig. 2.

There are certain locations where the type shown in Fig. 1 is not applicable. For example, in a piece of property in the central part of the city where the land values are high and where, in order to show a good development and a satisfactory return on the investment to the owners, it is necessary to develop to the limit each square foot of property. In this instance Fig. 2 would be far more applicable than Fig. 1. It is easy to see that within a given area the number of seats to be obtained can be far greater in the type using balcony and gallery than in the so-called bleacher type.

The name "bleacher type" is a misnomer and to a certain extent is a detriment to the theater to which it is applied, as it immediately creates in the minds of the patrons, who are not thoroughly familiar with the situation, an idea of a house which is roughly divided into two classes, similar to the orchestra floor and the gallery of another type of house. This, however, is not the case with the type shown in Fig. 1, as the seats throughout the entire section are equally desirable, and the vision from one seat is as good as that from any other. This is obviously not always true of the type shown in Fig. 2.

In many of the theaters throughout the country and Canada in recent years the type shown in Fig. 1 has been developed quite extensively. The Regent Theater, Pitts-

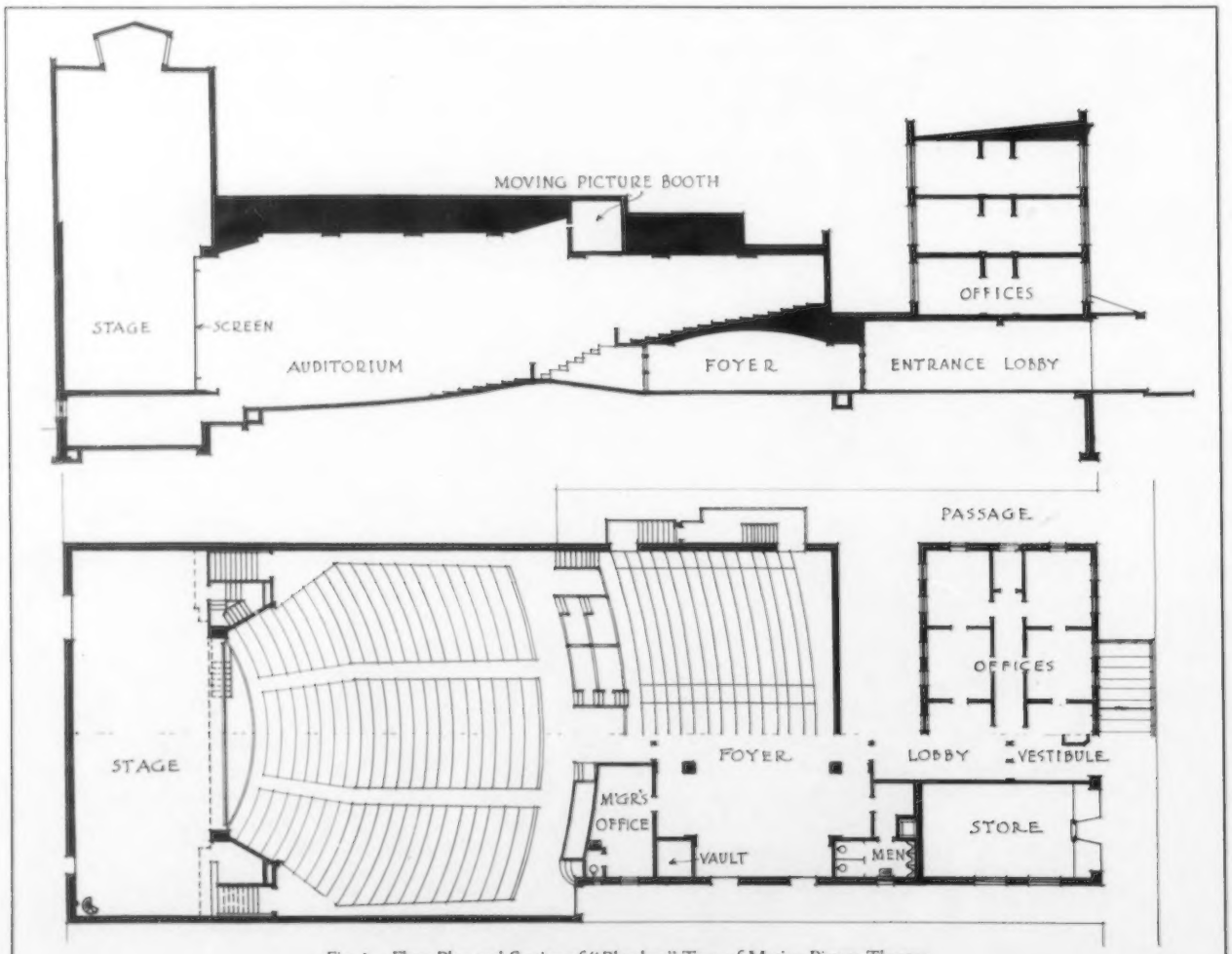


Fig. 1. Floor Plan and Section of "Bleacher" Type of Motion Picture Theater

burgh, the Majestic Theater in Detroit, Keith Theater in Montreal, are on this same general plan.

There is a tremendous advantage in the type illustrated in Fig. 1, which has been called the bleacher type, over any other type of construction, with the exception of the plain single floor house, and this is due, under the present conditions, to the high cost of certain of the materials.

The elimination of large fabricated girders and expensive riveted columns, and of large unsupported spans in the construction of a balcony in the multiple type of house, as well as the shortening of the spans and girders in case of a second class constructed house, are points of particular interest in the examination of the relative merits of the two types illustrated.

In many cases of this type of construction the spans may be longer as far as distance between the walls is concerned, but even where this condition prevails, the only construction necessary to make the complete span without obstructions is in the roof, and here light iron trusses can be used, arranged in such a way that the exterior walls need not be carried to the level of the top chord, which, as can readily be seen, reduces materially the cost of construction. The construction of the rear portion of orchestra floor can be carried out on the supports which may easily be provided for through the room arrangement, etc., and through the lobbies which occur directly beneath.

As another illustration of the relative cost of these two types of plans, it may be well to give an approximate cost per cubic foot for types in Fig. 1 and Fig. 2. In the first type the estimate is of very recent date based on drawings almost identical with Fig. 1 and shows a construction the cost of which would probably not exceed 15 cents per cubic foot, if the rear of the orchestra be of second class construction, and 18 to 26 cents if it be constructed entirely of reinforced concrete and steel.

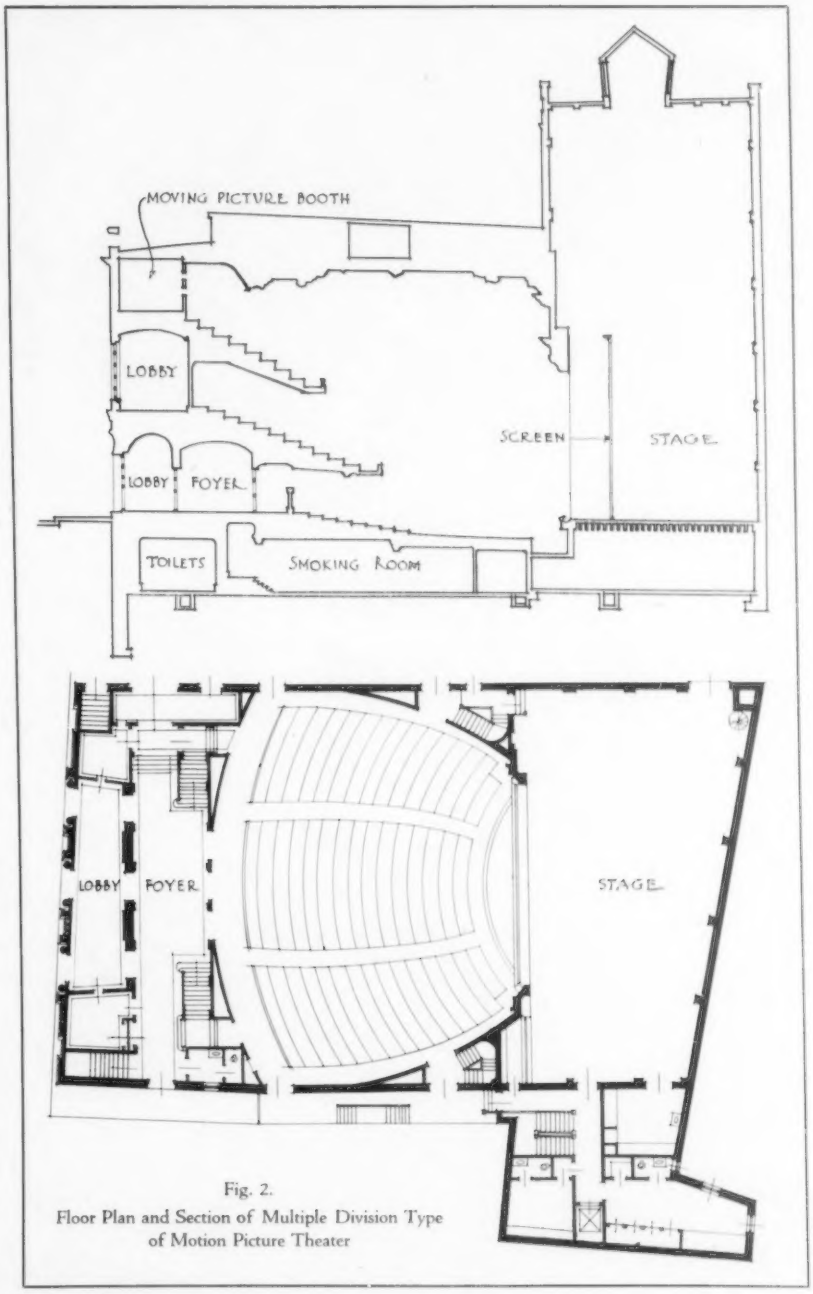


Fig. 2.
Floor Plan and Section of Multiple Division Type of Motion Picture Theater

The type represented by Fig. 2 would cost, on the basis of same materials used, from 18 cents for second class construction to 30 cents for steel and concrete.

In localities where second class construction may be used and inexpensive back land may be developed, Fig. 1 shows a very economical type of motion picture theater.

There are also other advantages in the single division type of house which will be apparent upon examination of the two plans. Each architect will differentiate between the two types according to his own judgment, but it may be well to point out a few considerations which all will agree are in favor of the type of building shown in Fig. 1.

The single division type (Fig. 1) shows a plan which can easily be developed so as to have coat rooms as well as manager's office, ushers' rooms, etc., opening on the foyer, but located in the less valuable space under the overhead seats.

In the multiple division type (Fig. 2) this is manifestly impossible and necessitates provisions elsewhere for these conveniences. These rooms in the majority of theaters of this type are placed either in an extension of the building, in the mezzanine floor, or in the basement, and in either case necessitate far greater expense as to construction than if placed as shown in the other plan. The other locations also are not so convenient or accessible, and it has been a matter of serious study for managers of various picture houses to properly provide for women's coat rooms,

rest rooms, and toilets, and a coat room, retiring room, and toilet for men for the various divisions of the house. Where there is but one division and where the patrons are all on the same plane, the problem is obviously simplified.

In case of the location of the women's rooms and general lobbies in the basement, as must necessarily be the case where an extension to the theater front may not be possible, the construction below the ground is of considerable expense, as in many instances it means excavation to such depth as to require the use of waterproofing methods. The type as illustrated in Fig. 1, however, requires no elaborate layout or expensive construction in the basement, and simple provisions for heating plant, coal, and janitor's closet are all that need be arranged to meet ordinary demands.



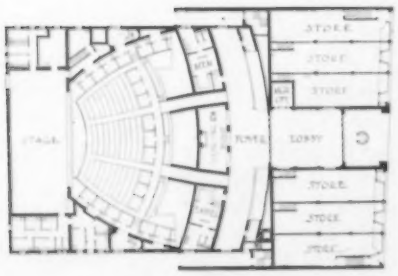
View of Foyer of Majestic Theater, Showing Ramp to Upper Level

It has been found in the majority of theater developments that where money is to be raised on a mortgage, the money is far more readily forthcoming if there may be provided "sub-rentals." These may be in the form of stores or offices, and in the case of the two types under contemplation it will be at once seen how much more readily the type proposed in Fig. 1 lends itself to this form of development than the type proposed in Fig. 2.

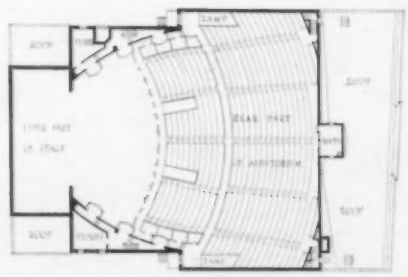
In the plans illustrated in Fig. 1 the stores shown at either side of the main entrance indicate the possibility of arranging for sub-rentals, and the arrangement of ladies' rooms, toilets, etc., is one susceptible of easy change. For example, if it were deemed advisable to arrange for deeper stores, the men's and women's rooms could be rearranged in connection with the lobby or placed in a basement a little below the level of the main floor. Under these conditions the additional income available as rent from the stores would more than offset the additional expense of the basement construction.



General View of Exterior



First Floor Plan



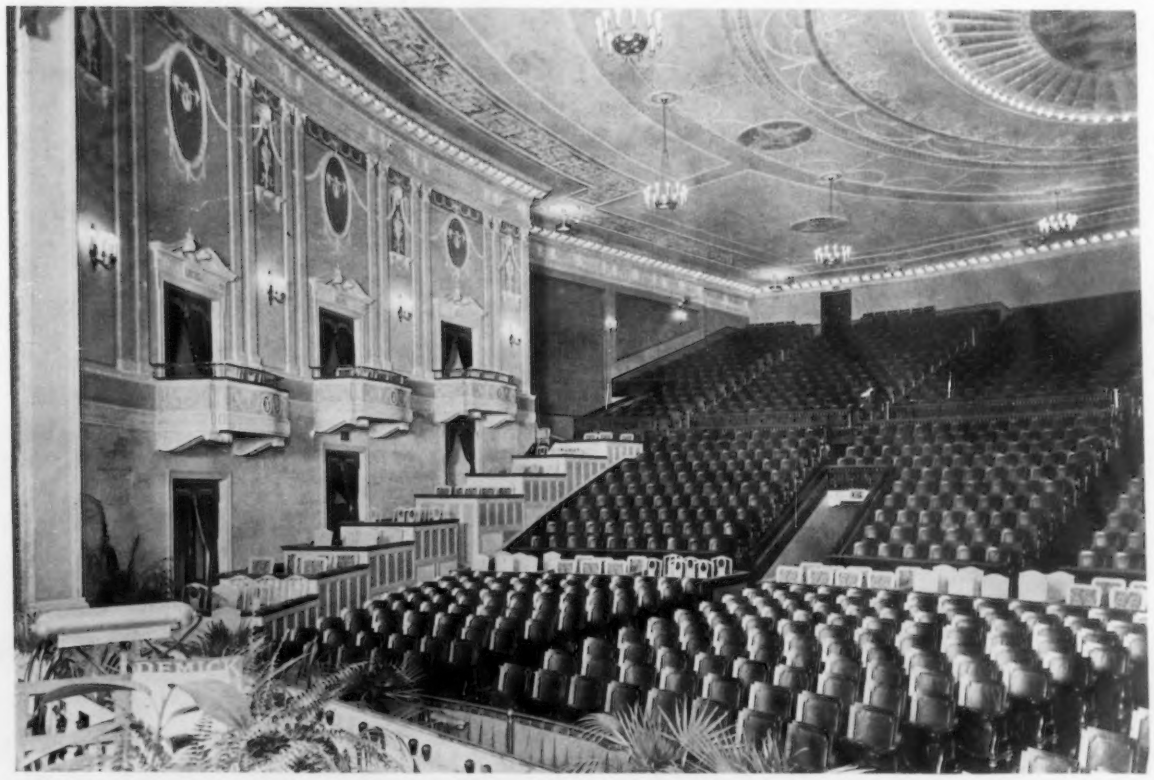
Third Floor Plan

Majestic Theater, Detroit, Mich.
C. Howard Crane, Architect

Theater managers nowadays are insistent upon keeping the people as close to the ground as possible, as they say it is almost impossible to make the patrons climb stairs. For this reason a large number of the more modern motion picture houses have been constructed with but a single balcony instead of the usual two balconies; but this type does not so readily meet the approval of the patrons occupying the rear seats as the type shown in Fig. 1. Here it will be readily seen that when all the patrons use a common entrance to the auditorium proper, the effort necessary to reach the rear row of seats at the upper level is no greater than would be required in going from the front to the rear of a balcony, and in addition the patrons are spared the necessity of climbing



VIEW OF AUDITORIUM AND STAGE FROM THE REAR



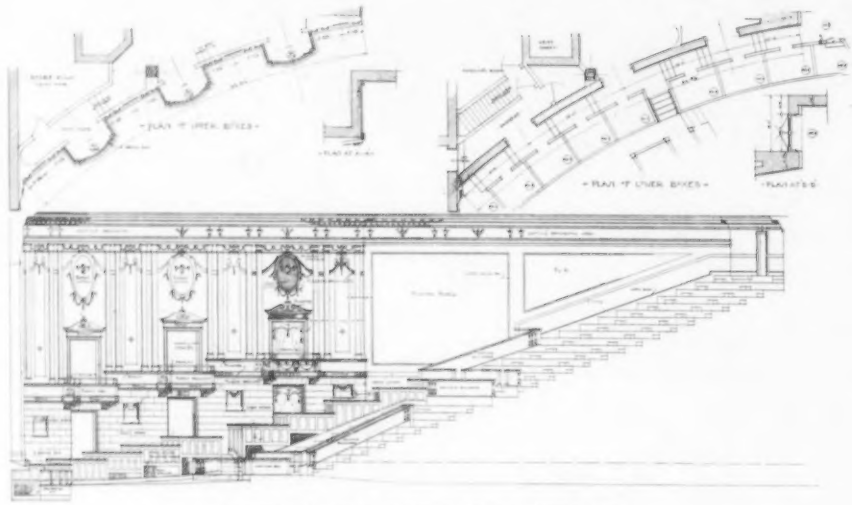
VIEW OF AUDITORIUM AND BOXES FROM THE STAGE

MAJESTIC THEATER, DETROIT, MICH.
C. HOWARD CRANE, ARCHITECT

stairs up to what would be the first row of seats in the balcony in the multiple division type of theater. It will be seen, therefore, that the advantages of administration, convenience to patrons, and economy of construction are all on the side of the single division type where such a form of building can be economically placed.

The location of the motion picture booth is of vital importance in every theater in which this form of entertainment is to be carried on, and there are several essentials which must be carefully studied in this connection.

The angle of the ray of light, the distance of the projector from the screen, the arrangement of the apertures, the location of the booth with reference to the seating levels—all must be carefully studied and properly correlated in order to assure satisfactory results.



Longitudinal Section, Majestic Theater, Detroit, Mich.

The vertical ray of light should never be greater than 25 degrees from a horizontal line taken at the center of the picture screen. This in itself is of considerable importance and will be discussed more fully in another article. This angle, however, does determine the relation of the picture booth to the seating levels and immediately establishes a zone beyond which the booth should not be placed. The lateral angle also must be maintained within the same limits. Usually the booth is located almost directly opposite the center of the screen and as a result the lateral angle does not enter into the problem.

In the multiple division type of house the booth is frequently placed at the upper balcony level or at the gallery level. In many instances this may be productive of satisfactory results. If, however, the auditorium is so arranged as to have a number of rows of seats in both balcony and gallery, the angle of the ray of light from the upper level is quite likely to exceed 25 degrees.

In the single division type of house the angle from the level of the highest row of seats would hardly be more than 15 degrees. In speaking of the level with reference to the seats, it must always be borne in mind that the lowest aperture level should be not less than 7 feet above the seat level so that patrons walking into the seats will not interfere with the light rays, and it is to this position that the reference is made in this discussion. There is another location which has been frequently adopted with considerable success, and that is directly over the seats in the balcony of the two division house or in the ceiling of a single division house.

The type illustrated in Fig. 1 shows this construction in reference to single division theater. The angle of the average ray of light to the center of the screen is approximately 18 to 20 degrees. Assuming that the light conditions and the construction and the mounting of the machine is correct, such a location would be a guarantee of satisfactory picture projection. One can readily see the difficulty attendant upon an attempt to locate a projecting machine in the same relative position in the multiple division type of house.

It is always possible in any type of theater to arrange the motion picture booth at the rear of the auditorium. This can be accomplished by projecting beyond the rear wall with the construction of the booth or by constructing the booth entirely within the theater. In the first case, there is no loss of seats, but the construction is expensive. In the second case, the construction is inexpensive, but there is a considerable seat loss. This point is one which must be carefully weighed as to whether the income from the seats will give a sufficient return upon the added investment due to the expensive construction of the booth outside the walls or whether it is better to sacrifice the seats.

If the booth be placed at the rear of the auditorium and the auditorium be so arranged that the depth is, say, 150 feet from the screen, the additional expense due to the increased intensity of the light necessary to give a clear projection is an item which materially affects the maintenance cost. In the single division type of house with the booth over the ceiling, as shown in the illustration, these considerations are not of particular importance as the length of the projection can be readily arranged within the 25 degree limit, and in no case except under extraordinary conditions need length of throw of the ray of light be more than 90 feet.

DOORWAY TO OLD BRICK HOUSE ON FREDERICK TURNPIKE, CARROLL COUNTY, MARYLAND

THE measured drawings on the two following pages show the detail of a doorway which is one of an original three in a very plain brick front of seven bays, the other four openings being windows alternating with the doors. The main cornice follows the same detail as that on the doors, and the proportions are likewise the same, but the size is just twice that of the cornice to the doors. The doorways are so overgrown with Virginia creeper that they are quite completely hidden, making it impossible to show a photographic view. The house is known to be at least 150 years old, and the state of preservation of the woodwork, which has had but a passing acquaintance with paint, is quite remarkable.

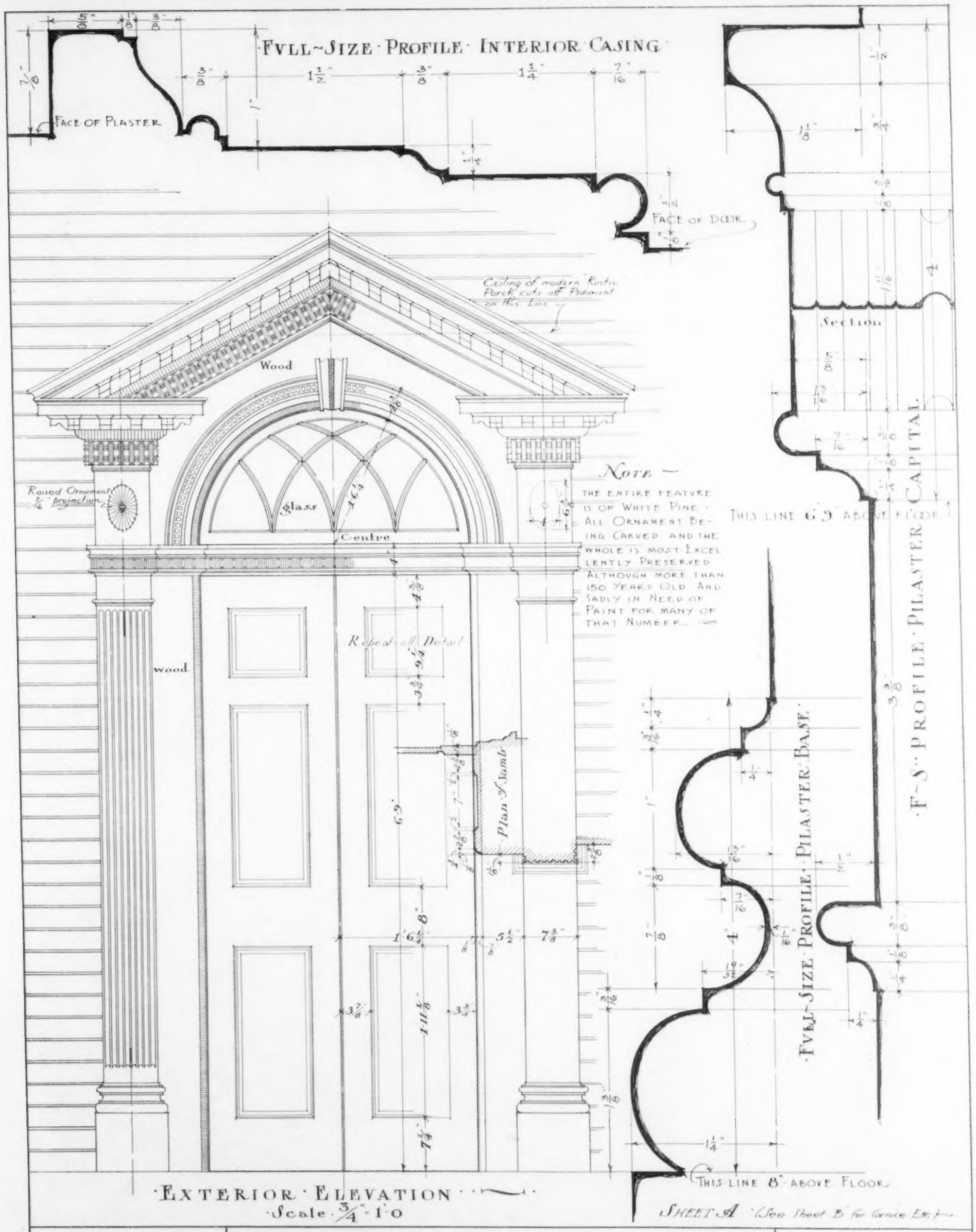


PLATE 42 JUNE 1917	DOORWAY TO OLD BRICK HOUSE ON FREDERICK TURNPIKE Carroll Co. MARYLAND	MEASURED and DRAWN by HARRY F. CUNNINGHAM assisted by E. L. Bullock Jr. Wm E. Humphrey Jr. and Y. Ogawa A° D° 1916

MISCELLANEOVS DETAILS

Scales –
FVLL-SIZE AND
HALF FVLL-SIZE
as noted –

Front

Side

Strands of Rope about ¾ inch

HALF FVLL-SIZE DETAIL OF CORNICE

MAIN CORNICE TO HOUSE. SAME DETAIL BUT TWICE AS LARGE.

Section

HALF-FVLL SIZE DETAILS OF KEYBLOCK

Line of Fascia Between Brackets

REFLECTED PLAN SHOWING BRACKETS MITRED AT CORNER

F-S Panel Mould to Doors & Jambs

Raised Panel in Doors only.

Line of Outer Fascia

THIS REEDED MOVLDING CARRIES ALL ROUND OPENING.

Inside

Outside

F.S MVNTIN
(from Transome Sash.)

FVLL-SIZE DETAIL OF ARCHIVOLT MOVLDINGS

SHEET "B" (See Sheet "A" for GENERAL ELEVATION)

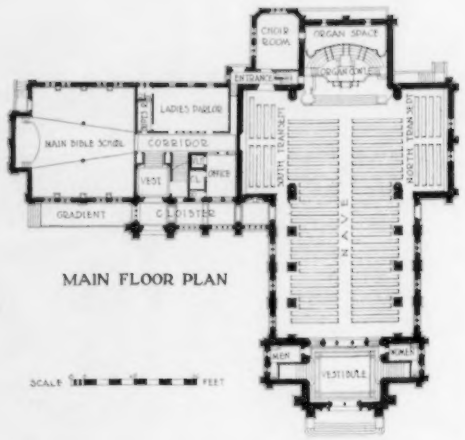
PLATE 43 JUNE 1917	DOORWAY TO OLD BRICK HOVSE ON FREDERICK TVRNPIKE Carroll Co MARYLAND	MEASVRED and DRAWN by HARRY F CVNNINGHAM assisted by E L Bullock Jr Wm E Humphrey Jr and Y Ogawa A.D. 1916



GENERAL VIEW FROM THE NORTHEAST

FIRST PRESBYTERIAN CHURCH, OAKLAND, CAL.

WILLIAM C. HAYS, ARCHITECT; CRAM & FERGUSON, CONSULTING ARCHITECTS



MAIN FLOOR PLAN

GENERAL VIEW OF CHURCH AND PARISH HOUSE

FIRST PRESBYTERIAN CHURCH, OAKLAND, CAL.

WILLIAM C. HAYS, ARCHITECT. CRAM & FERGUSON, CONSULTING ARCHITECTS



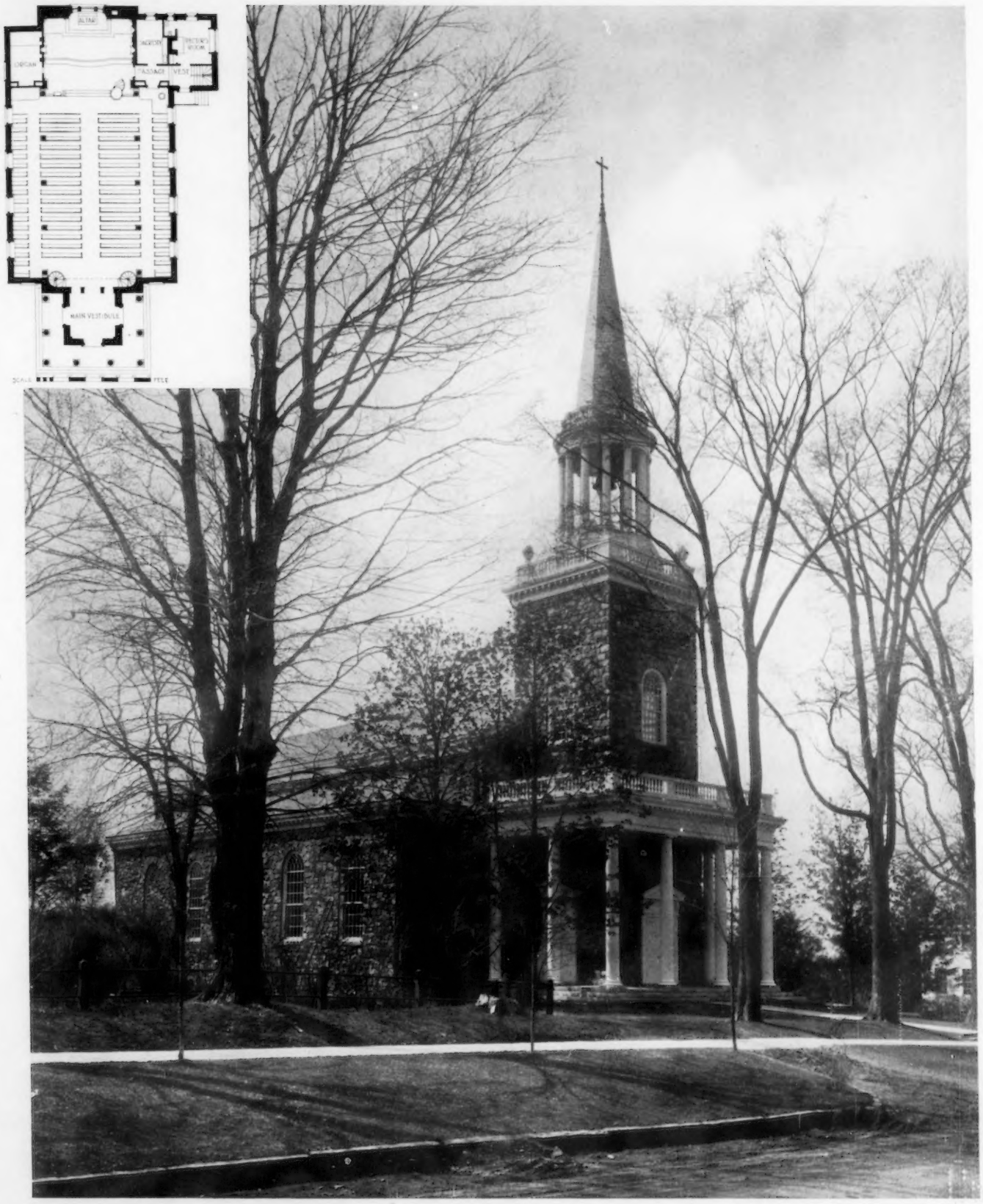
DETAIL VIEW OF CHANCEL AND ORGAN SCREEN



INTERIOR VIEW LOOKING EAST TOWARD GALLERY

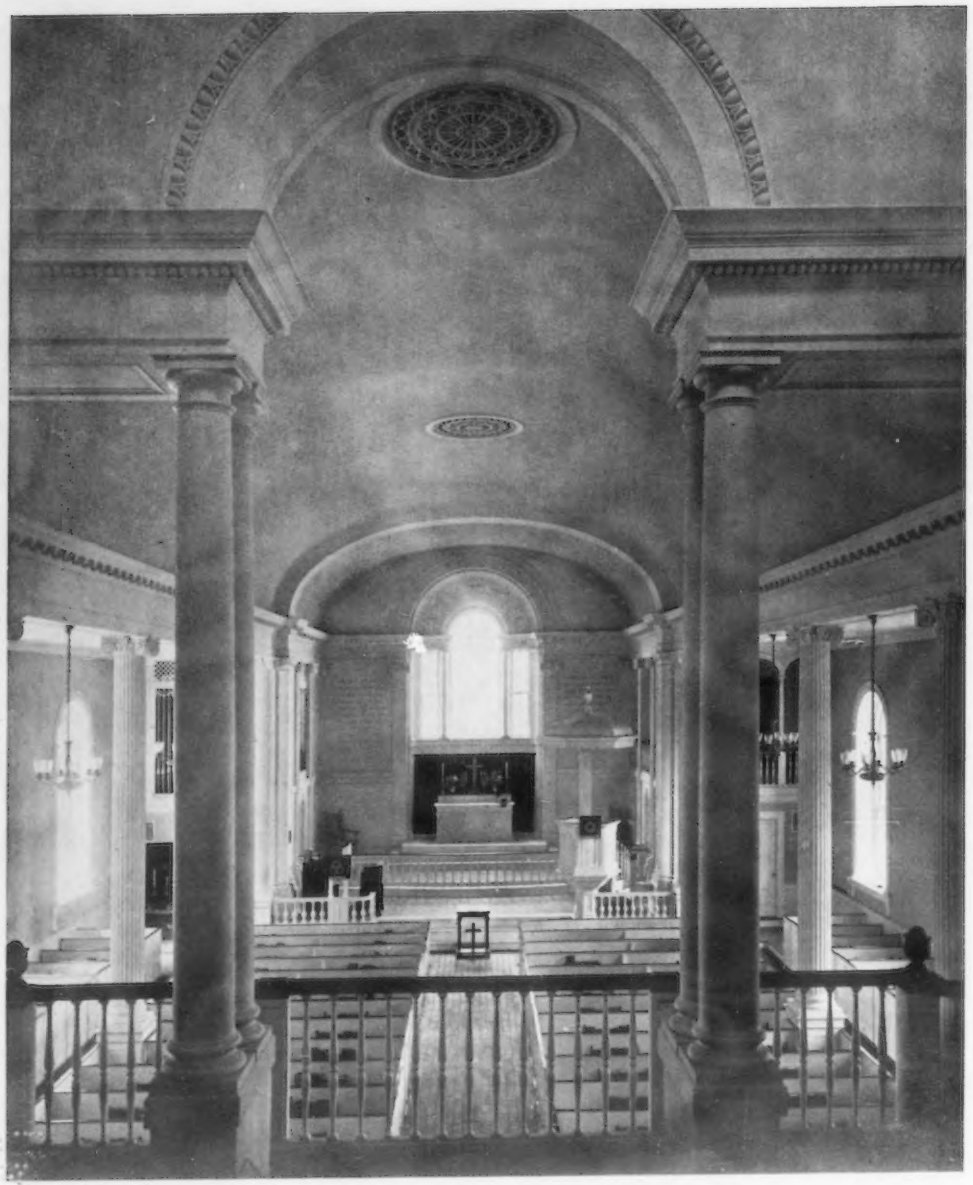
FIRST PRESBYTERIAN CHURCH, OAKLAND, CAL.

WILLIAM C. HAYS, ARCHITECT; CRAM & FERGUSON, CONSULTING ARCHITECTS



ST. STEPHEN'S EPISCOPAL CHURCH, RIDGEFIELD, CONN.

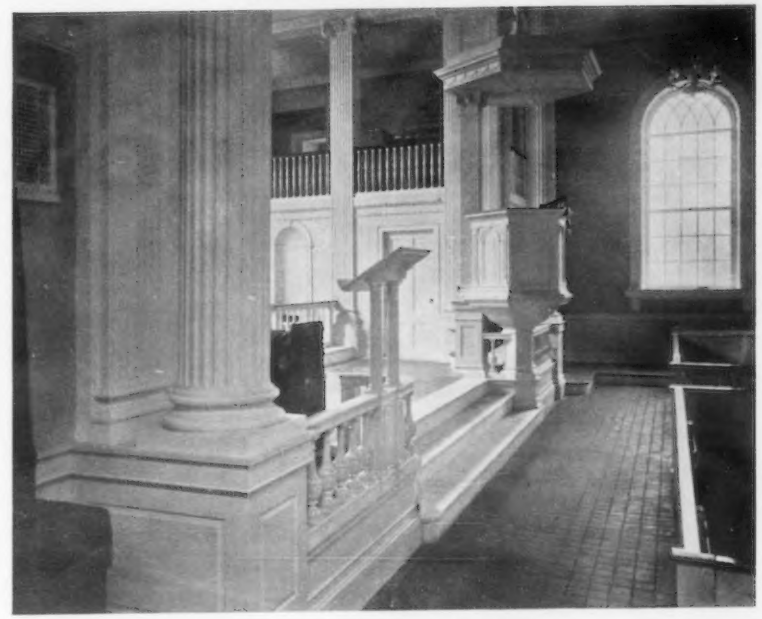
W KERR RAINSFORD, ARCHITECT



VIEW OF INTERIOR FROM TOWER ALCOVE



STAIRWAY TO TOWER ALCOVE



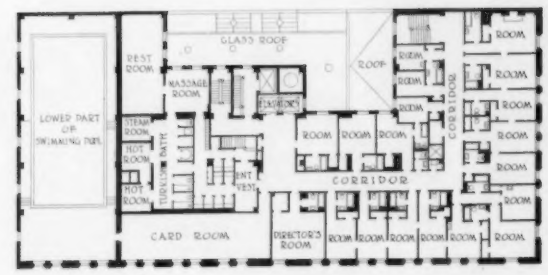
VIEW OF CHANCEL AND PULPIT

ST STEPHEN'S EPISCOPAL CHURCH, RIDGEFIELD, CONN

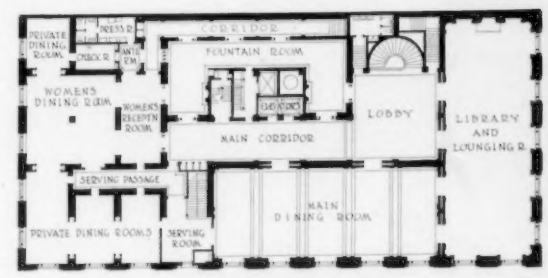
W KERR RAINSFORD, ARCHITECT



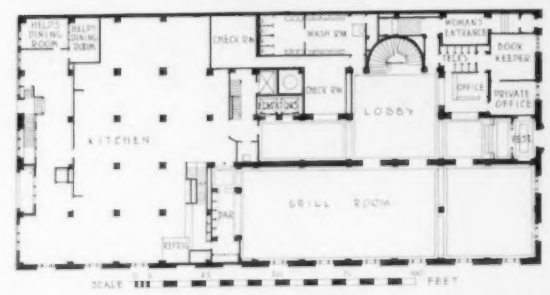
GENERAL VIEW OF EXTERIOR



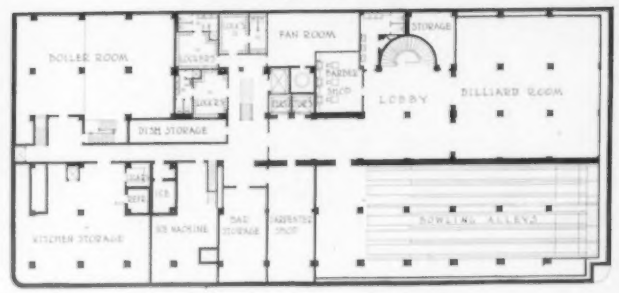
THIRD FLOOR PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN



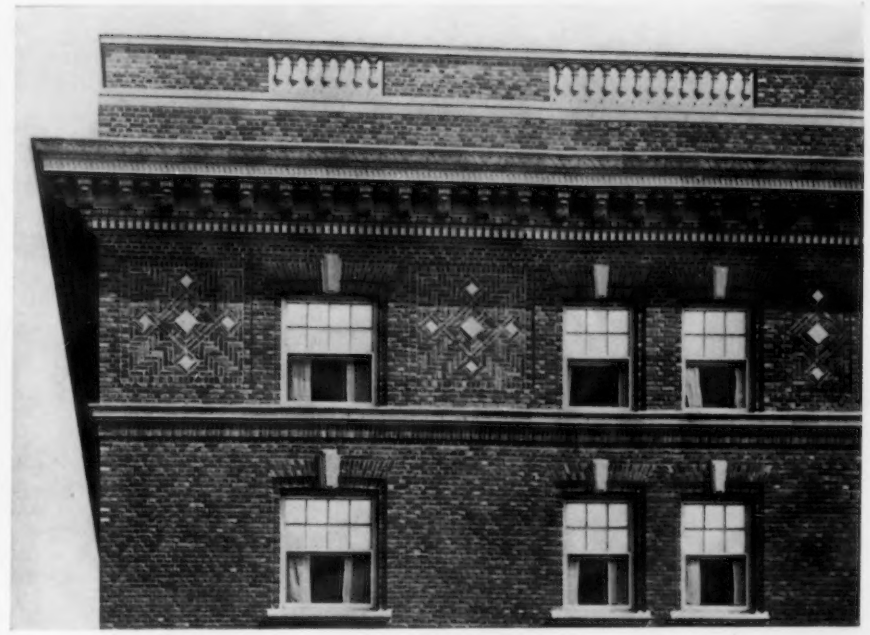
BASEMENT FLOOR PLAN

ATHLETIC CLUB, COLUMBUS, OHIO

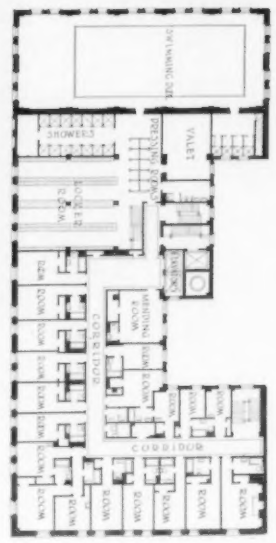
RICHARDS, McCARTHY & BULFORD, ARCHITECTS



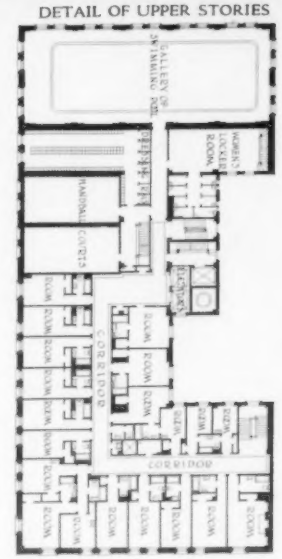
DETAIL OF LOWER STORIES



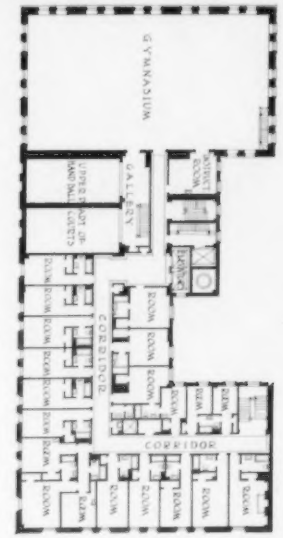
DETAIL OF UPPER STORIES



FOURTH FLOOR PLAN



FIFTH FLOOR PLAN



SIXTH FLOOR PLAN

ATHLETIC CLUB, COLUMBUS, OHIO

RICHARDS, McCARTHY & BULFORD, ARCHITECTS



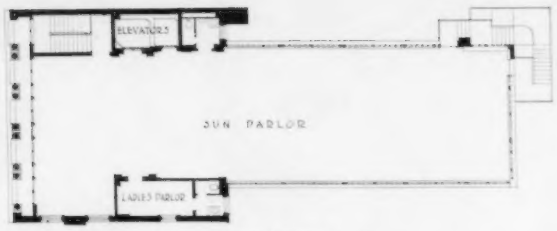
LIBRARY AND LOUNGING ROOM



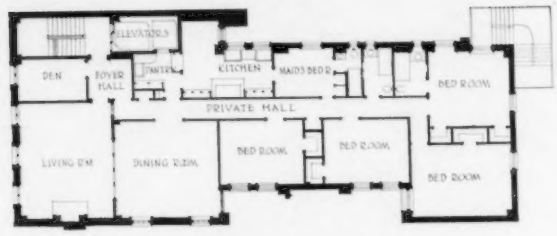
GRILL ROOM

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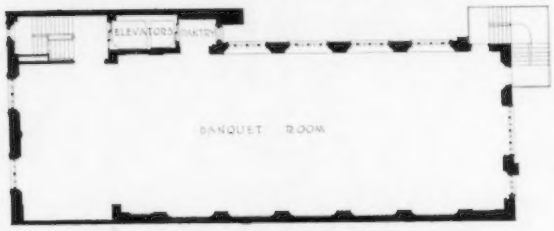
RICHARDS, McCARTHY & BULFORD, ARCHITECTS



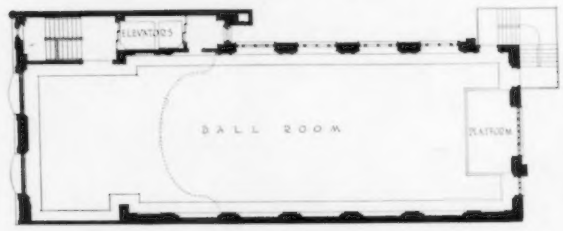
FIFTH FLOOR PLAN



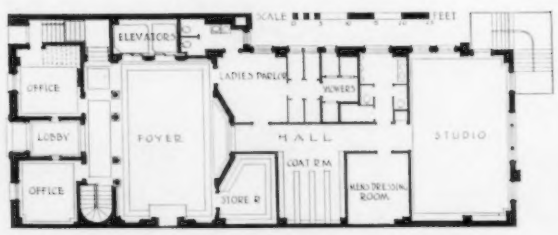
FOURTH FLOOR PLAN



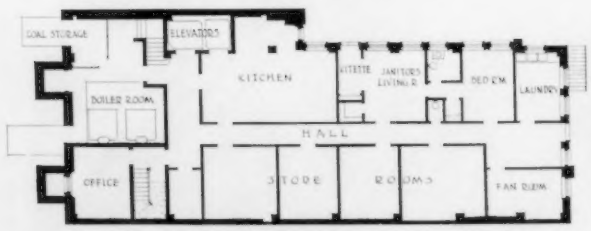
THIRD FLOOR PLAN



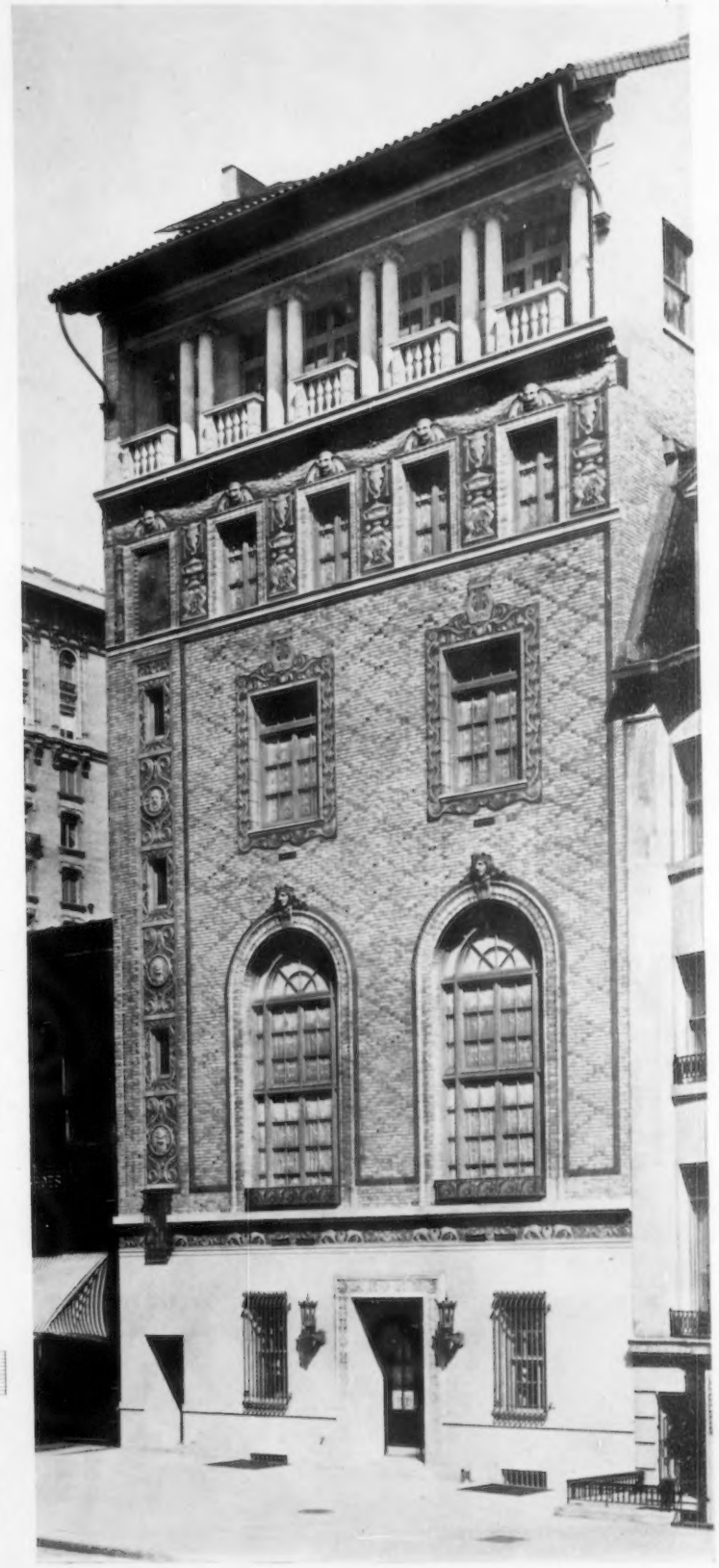
SECOND FLOOR PLAN



FIRST FLOOR PLAN



BASEMENT FLOOR PLAN



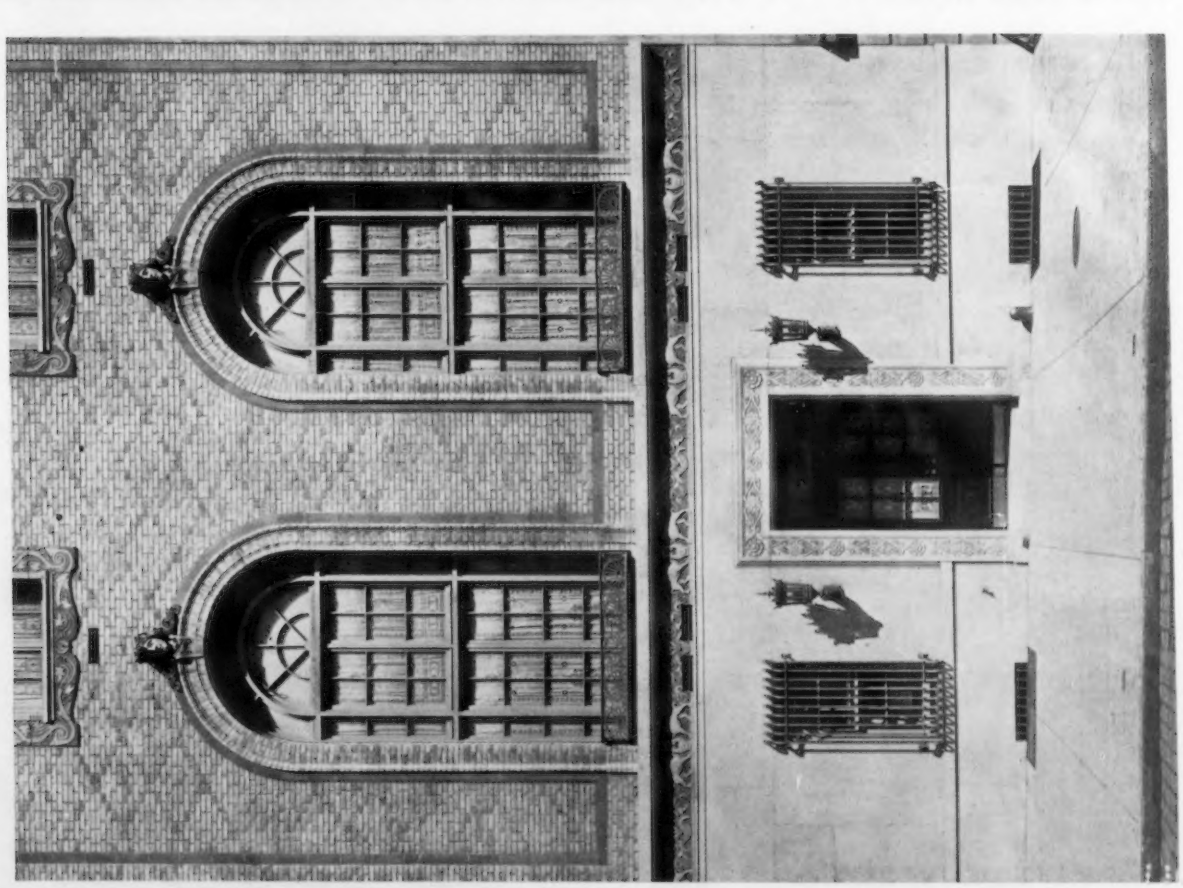
GENERAL VIEW OF FACADE

CHALIF SCHOOL OF DANCING, WEST 57TH STREET, NEW YORK, N. Y.

G. A. & H. BOEHM, ARCHITECTS



DETAIL OF BALLROOM WALL

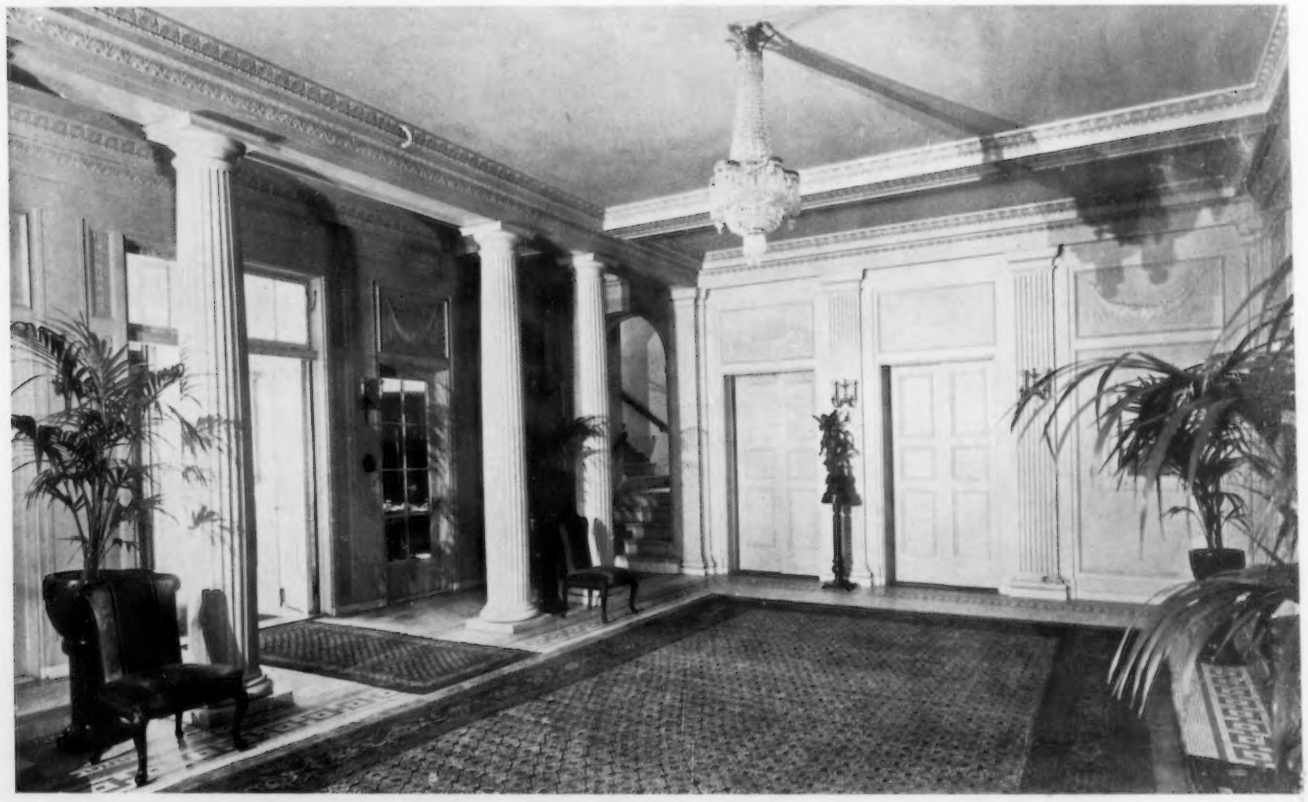


DETAIL OF LOWER STORIES

CHALIF SCHOOL OF DANCING, WEST 57TH STREET, NEW YORK, N. Y.
G. A. & H. BOEHM, ARCHITECTS



VIEW OF BALLROOM



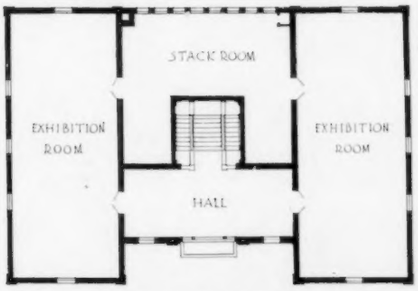
VIEW OF ENTRANCE FOYER

CHALIF SCHOOL OF DANCING, WEST 57TH STREET, NEW YORK, N. Y.

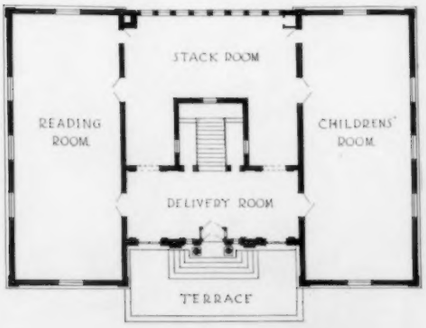
G. A. & H. BOEHM, ARCHITECTS



GENERAL VIEW OF MAIN FACADE



SECOND FLOOR PLAN



FIRST FLOOR PLAN



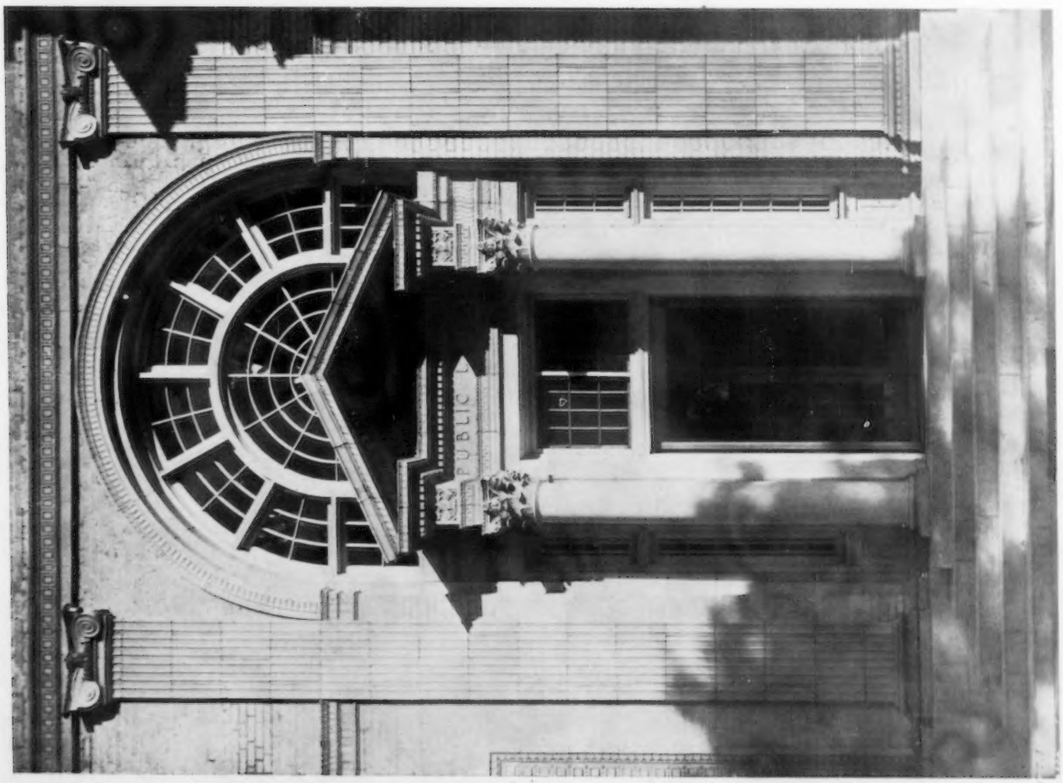
ENTRANCE LOBBY

PUBLIC LIBRARY BUILDING, NEW ROCHELLE, N. Y.

ALBERT RANDOLPH ROSS, ARCHITECT

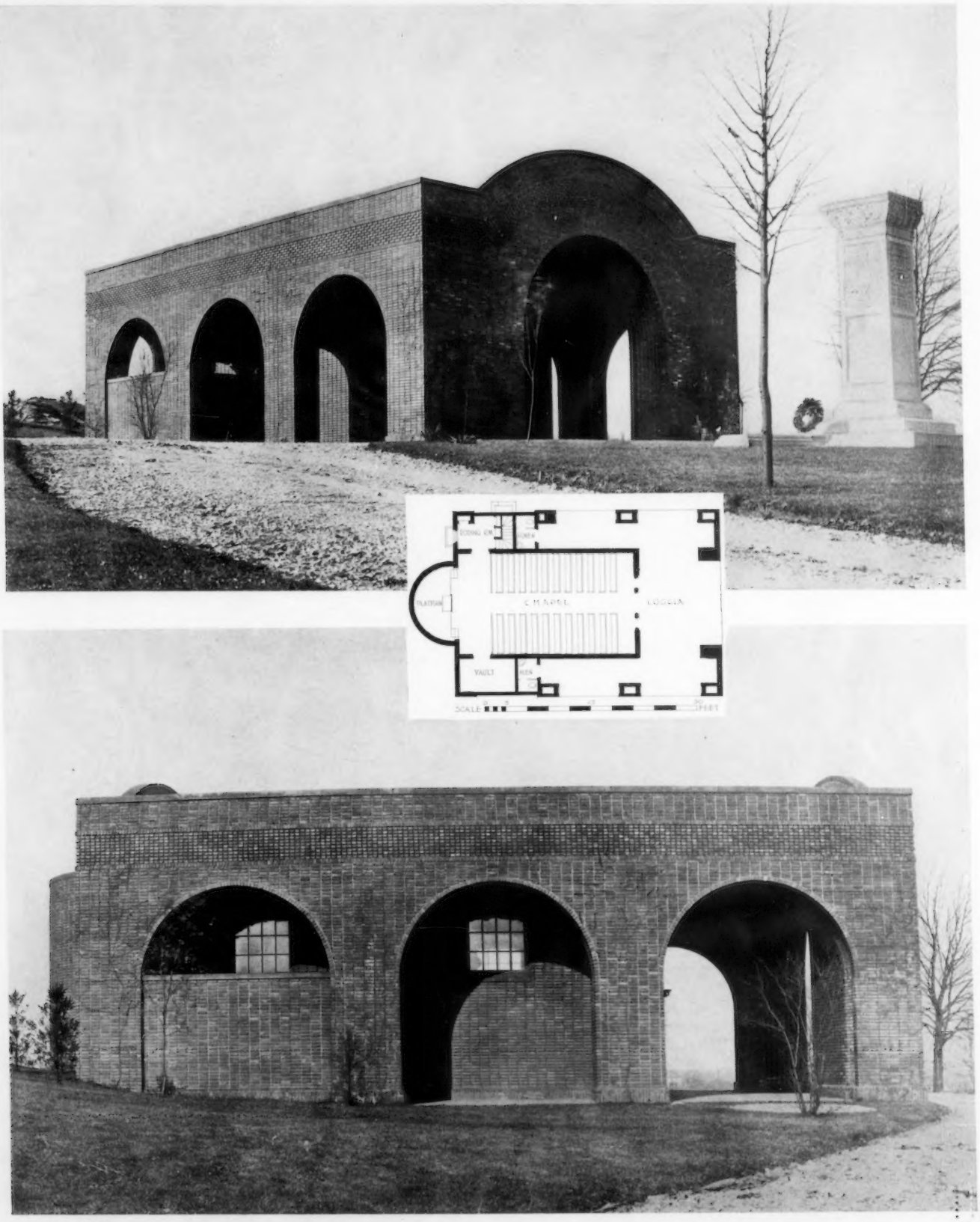


DETAIL OF SIDE DOORWAY



DETAIL OF MAIN ENTRANCE

PUBLIC LIBRARY BUILDING, NEW ROCHELLE, N. Y.
ALBERT RANDOLPH ROSS, ARCHITECT

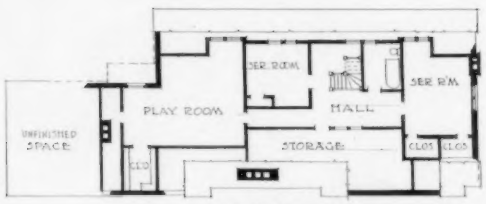


MORTUARY CHAPEL, WEST VIEW CEMETERY, PITTSBURGH, PA.

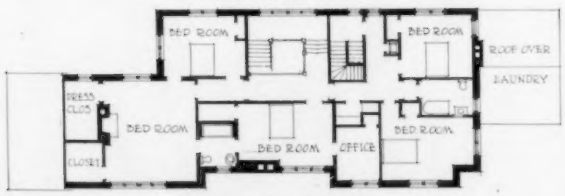
PALMER, HORNBOSTEL & JONES, ARCHITECTS



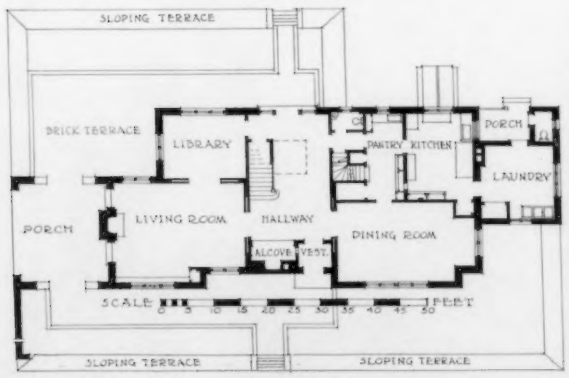
GENERAL VIEW FROM STREET



THIRD FLOOR PLAN



SECOND FLOOR PLAN



FIRST FLOOR PLAN



VIEW ALONG TERRACE

HOUSE OF W. A. HENDRICKSON, ESQ., RIVERTON, N. J.

SIMON & BASSETT, ARCHITECTS



ENTRANCE HALL



LIVING ROOM

HOUSE OF W. A. HENDRICKSON, ESQ., RIVERTON, N. J.

SIMON & BASSETT, ARCHITECTS

Details of Italian Renaissance Architecture

MEASURED DRAWINGS BY MAURICE P. MEADE

THE accompanying plates continue the same general type of details as those illustrated in the two previous series, and represent some additional examples of Italian Renaissance work from buildings in Rome and Siena. The latter city, lying between Rome and Florence, shows an architecture influenced by both centers of culture, but with certain local characteristics as well, notably in the more extensive use of combinations of brick and stone.



Doorway of the Church of S. Lorenzo in Damaso
Cancelleria Palace, Rome

The first plate shows a doorway in the principal front of the Palazzo della Cancelleria, placed somewhat to the right of the main entrance of the palace. This doorway forms the entrance to the Church of San Lorenzo in Damaso, which is incorporated in the palace, though without any indication on the exterior. The reveal of this doorway is greater than is the case in most doorways of the Renaissance in Italy. The simplicity of the mouldings, both of the door and the architrave, is also worthy of notice, the only ornamentation being the leaf motif in the soffit of the cornice and the decoration of the consoles. The architrave mouldings, breaking at the bottom of the consoles and cut off square at the door sill without a return, show a type of doorway unusual in the Renaissance period, and much bolder in execution than the ornamented doorways so common at the time. The section through the frieze of the entablature over the doorway may also be noted, as it differs considerably from most of the work of the period.

The Cancelleria Palace was designed by Bramante and is a characteristic example of his skill in design and in the use of mouldings. Like most of his work, it shows a high degree of refinement, amounting almost at times to monotony, although relieved by a few features of special importance. The base mouldings and the belt course under the windows of the ground floor which are shown on the second plate are worthy of study for their relation to the rusticated surface of the wall. These mouldings return on themselves at the sides of the doorway of the church, while at the main doorway of the palace they are stopped against the pilasters.

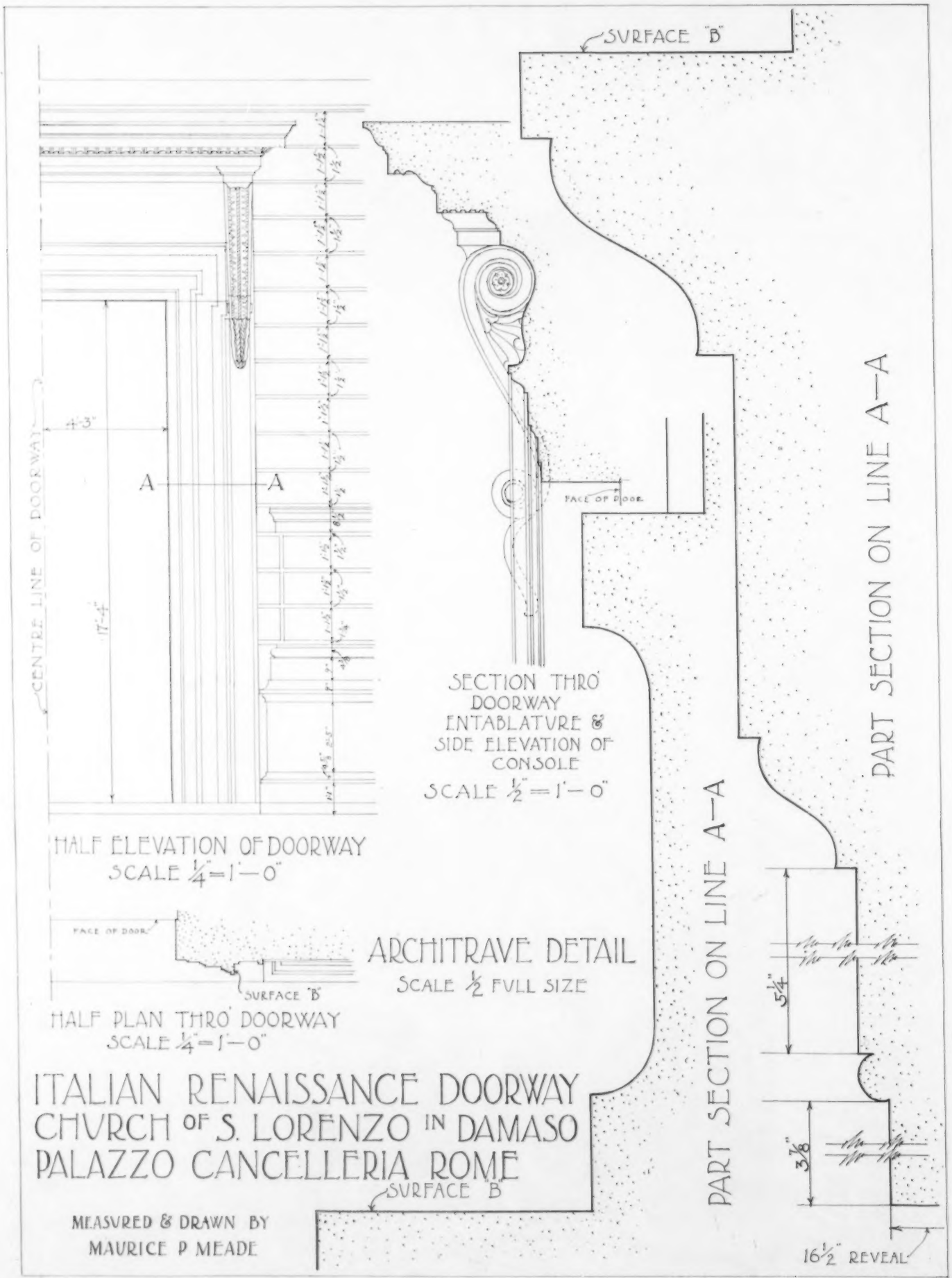
In the Palazzo Galitzin the base mouldings are somewhat finer in scale, and the rustication is more delicately executed; thus, for instance, the margins of the rusticated members have a tooled surface, and the width and depth of the channels are less than those of the Cancelleria. The first story belt courses of both buildings present the same form of moulding, though that of the Galitzin is finer in scale.

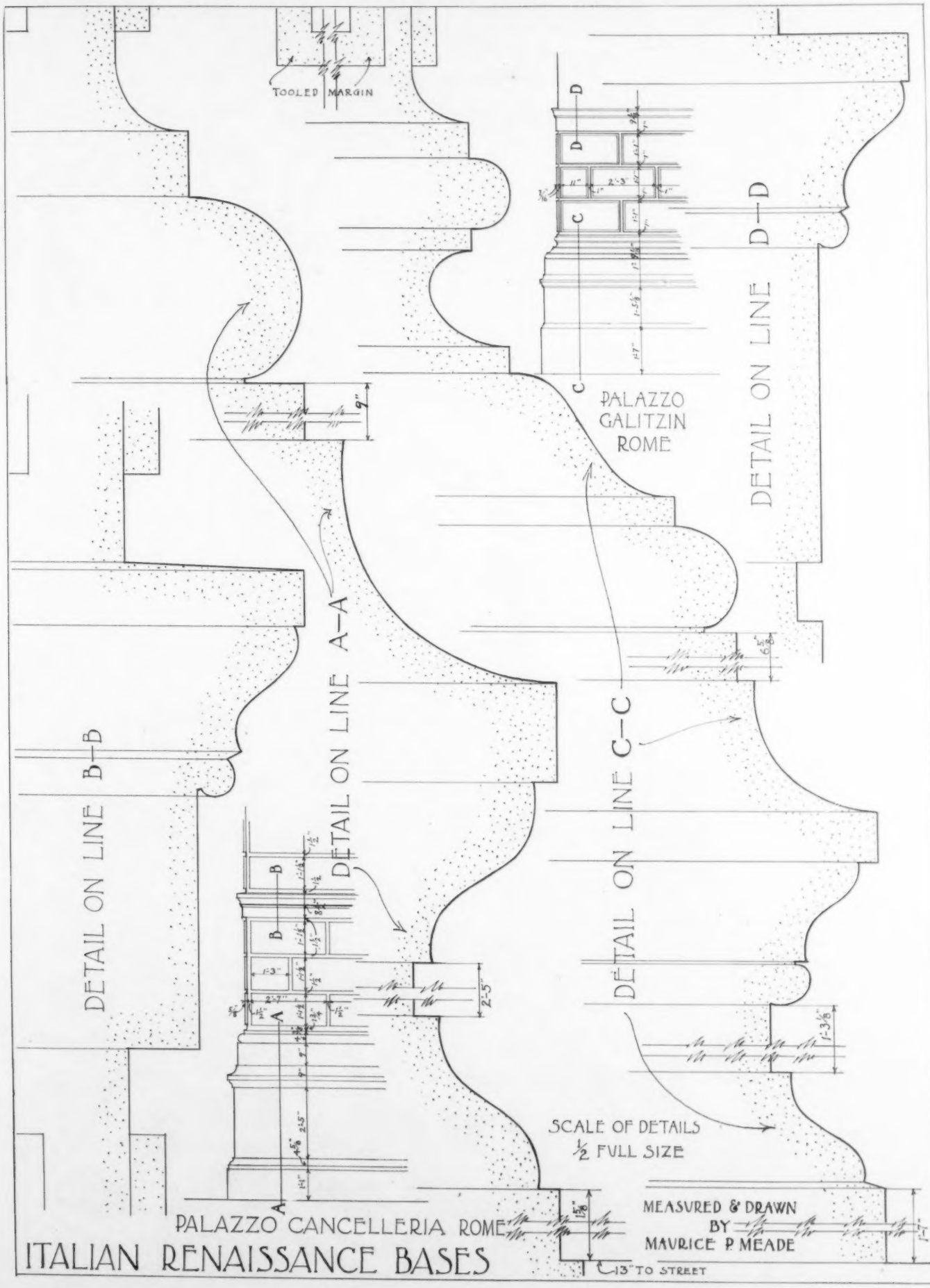
The third plate of the series is of the front of a house in Siena, and shows the general proportions of the door and window openings, and the relation of the stone belt courses to the brick wall surface in the typical Sienese manner. The doorway is beautifully proportioned, though extremely simple in its details. The architrave mouldings are cut off square at the street line instead of returning on themselves, as is the usual form. The first story window architraves have mouldings that continue around all four sides, so as to form a complete frame for the opening.

On the second and third floors the belt courses form the sills of the windows.

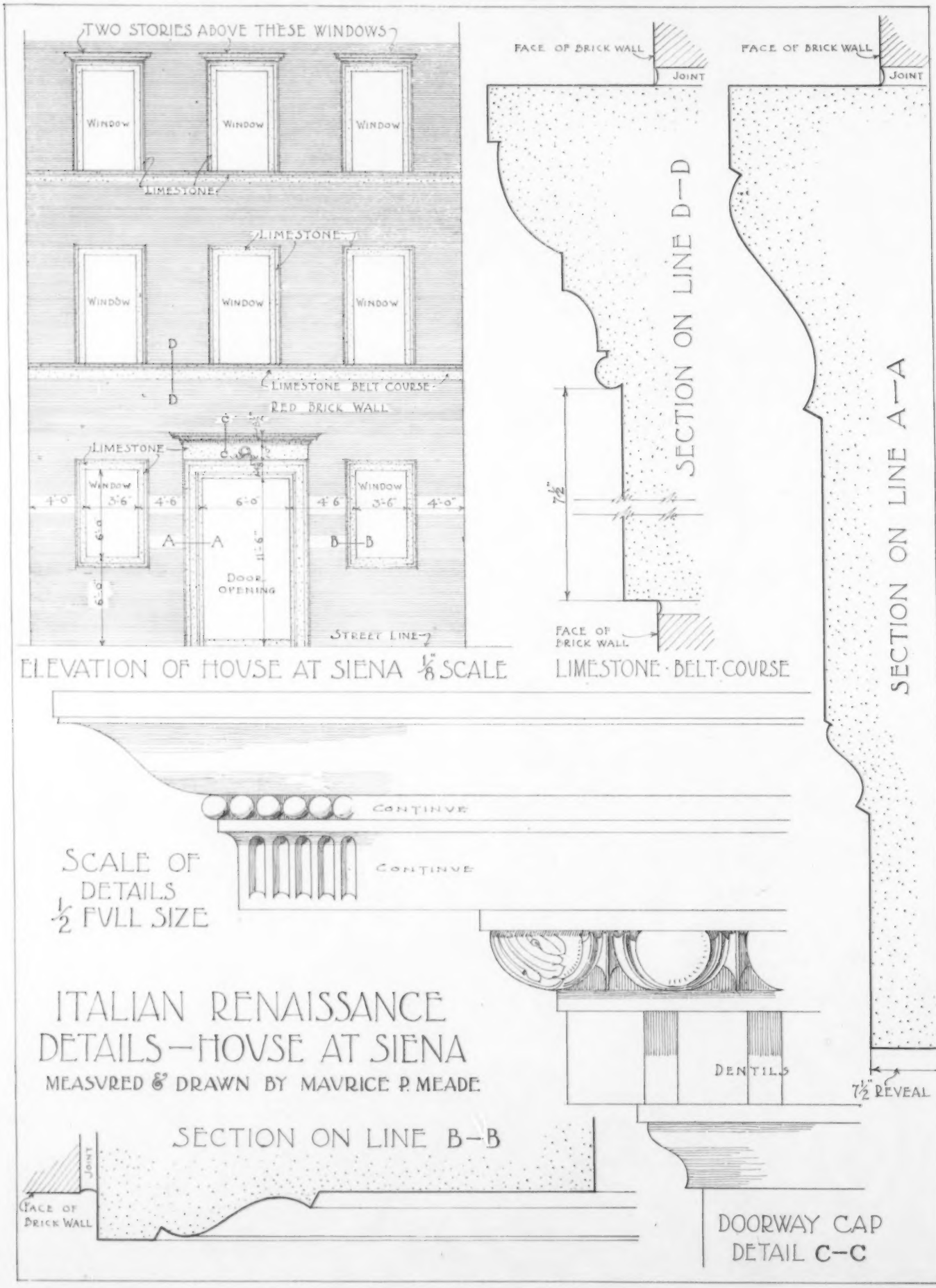


General View of the Cancelleria Palace, Rome


SURFACE "B"
4'-3"
A
A
CENTRE LINE OF DOORWAY
17'-4"
FACE OF DOOR
SECTION THRO' DOORWAY ENTABLATURE & SIDE ELEVATION OF CONSOLE
SCALE ½"=1'-0"
HALF ELEVATION OF DOORWAY
SCALE ¼"=1'-0"
FACE OF DOOR
SURFACE "B"
HALF PLAN THRO' DOORWAY
SCALE ¼"=1'-0"
ARCHITRAVE DETAIL
SCALE ½ FULL SIZE
ITALIAN RENAISSANCE DOORWAY
CHURCH OF S. LORENZO IN DAMASO
PALAZZO CANCELLERIA ROME
MEASURED & DRAWN BY
MAURICE P MEADE
SURFACE "B"
PART SECTION ON LINE A—A
PART SECTION ON LINE A—A
5¼"
3⅜"
16½" REVEAL



ITALIAN RENAISSANCE BASES


TWO STORIES ABOVE THESE WINDOWS
WINDOW
WINDOW
WINDOW
LIMESTONE
LIMESTONE
WINDOW
WINDOW
WINDOW
D
D
LIMESTONE BELT COURSE
RED BRICK WALL
C
C
LIMESTONE
WINDOW
3'-6"
WINDOW
3'-6"
4'-0"
4'-6"
6'-0"
4'-6"
4'-0"
6'-0"
A
A
B
B
11'-6"
DOOR OPENING
6'-0"
STREET LINE
ELEVATION OF HOUSE AT SIENA 1/8 SCALE
FACE OF BRICK WALL
JOINT
SECTION ON LINE D—D
7½"
FACE OF BRICK WALL
LIMESTONE · BELT · COURSE
FACE OF BRICK WALL
JOINT
SECTION ON LINE A—A
CONTINVE
CONTINVE
SCALE OF DETAILS ½ FULL SIZE
DENTILS
7½" REVEAL
ITALIAN RENAISSANCE
DETAILS—HOUSE AT SIENA
MEASURED & DRAWN BY MAURICE P. MEADE
SECTION ON LINE B—B
JOINT
FACE OF BRICK WALL
DOORWAY CAP
DETAIL C—C

The Problem of the General Contractor

By WILFRED W. BEACH

THE relation between the architect and the builders of his structures has been so often discussed that it would appear that little that is new can be said on the subject.

Nevertheless there are certain phases of the changing relations between owner, architect, and contractors which have been brought about by the evolution of the business side of present-day construction that are worthy of serious thought.

Buildings—those of any pretense—have ever been the combined product of artist and artisan. Up to comparatively modern times the two functions were frequently unified in a single individual, called the "architect," who worked with the other mechanics the while he directed their endeavors.

Out of the formation of trades guilds in the Middle Ages grew the labor contractor, or "undertaker," who undertook to provide all the labor in his line on a given structure—labor unionism in its early form, but founded on apprenticeship and craftsmanship, not on the activities and avarice of the business agent.

Then, of necessity, followed the contractor for supplies and factory products. The so-called "general contractor" is an outcropping of much later date—a real modernity, in fact.

Architects of present-day practice have become so accustomed to the general contractor and his apparent necessity that they are likely to overlook the fact of his so-recent evolution. Witness that portion of the American Institute definition of an architect which describes one of his functions as "supervising the operations of contractors" instead of "supervising construction."

And some architects, much to their discomfiture, have been made to realize that, in bringing forth this individual for the purpose of shouldering some of the onerous duties incidental to actual construction, they have hatched out a veritable cuckoo-bird which bids fair to oust its foster parents from their perch.

The theoretical relation between architect and contractor is plainly set forth in the printed form of the "Uniform Contract." The contractor is assumed to be rather an undependable depredatory individual with whom another individual, styled the "owner," enters into an agreement, but with small confidence that he is not the victim of a savage wolf intent on fleecing him. To prevent such fleecing he retains the architect, as the best informed personage on the subject matter of the contract, to act as a sleepless detective on the job. And many times he will blame his detective more for having slept a little than he will the contractor for having "put something over." It was to be expected of the contractor, whose interests as stipulated in the contract are diametrically opposed to those of the owner, "but what . . . is the architect paid for?"

Architects may ascribe to themselves all the dignity they can throw into their profession, and then add a modicum, without being able to overcome the opprobrium that attaches to the office of the "gum-shoe" artist, which office, in the mind of the average owner, the architect deliberately assumes when undertaking to superintend a work of construction.

This triangular relation is the direct outcome of the building up of the contracting system which, in turn, was the result of commercial conditions of a bygone generation. Time was, not so *very* long ago, when commercial probity was a joke; when a buyer had no protection but his own acumen, and when great wealth was its own justification, regardless of the means of accumulation. Under such conditions neither reinforced concrete nor heaviest armor plate were barriers too strong behind which to safeguard the interests of the most wary individual when he found it necessary to enter into a building agreement with a rapacious contractor.

Small wonder either that, under such conditions, the detective hireling sometimes went wrong. With the owner trying to beat the contractor full as often as the reverse, the architect must have been a superior personage indeed if, after having been forced down to the lowest possible fee for himself, he did not try to recoup when opportunity offered. Evidence might be adduced to show that he did—too often for his own reputation and that of his confrères.

The writer has in his mail to-day a printed circular from the manufacturer of a building appliance containing the following paragraph:

"The prices shown on page 23 are list—the prices your customer should pay. You are entitled to a trade discount of 10 per cent."

And the circular was prepared for distribution among architects, though worded as if for supply houses.

In what degree these conditions still maintain; to what extent the necessity for the contracting system—more especially the general contracting system—still remains, seems certainly to be a subject for serious reflection.

Architects' methods of practice are largely founded on that system, as it in turn is builded on those methods. All drawings and specifications are so formulated and worded that a legal contract can be executed thereupon. And the average owner, though he may in other matters be educated to the most up-to-date commercial reciprocity, will deliberately brace himself against that contract and direct his architect to assign his work to the lowest bidders, regardless of their reputations for ignorance or dishonesty, then assume that it is up to the architect to earn his detective fee.

And it is to be believed that he earns it.

All this is quite too trite.

The average contractor may be any one of several sorts—he may be, but seldom is, a person of technical education, thoroughly grounded in every branch of building; or he may be a promoted carpenter or mason or concrete worker or paving inspector; or simply a building broker capable of assembling the bids of sub-contractors. He may even be a gigantic corporation—a building entity administered by a skilled financier or a committee; but, in the average, the chances are against the general con-

tractor being a good business man. Ordinarily, he is not. If he were, the prospect of his getting a fair share of business would not be good.

This was succinctly set forth by Mr. G. Alexander Wright in an address on estimating given before the General Contractors' Association of San Francisco, April 10, 1913.

Said he: "When bidders are asked to submit bids, they are theoretically asked, of course, to submit competitive prices, but in actual practice their bids are based upon competitive quantities, before the competition in prices commences; which, in my opinion, is as unjust to the contractor as it is ridiculous. . . . One or more bidders, through being hurried or being unable to take off the quantities accurately, leaves something out. What happens? Their bids are consequently low, and the owner benefits, at the low bidder's expense, whilst the competent or more careful bidder loses the job, because his quantities are more accurate, or because there may have been room for uncertainty when figuring the plans and specifications.

"Not long ago a general contractor, whom I have known over twenty years, told me that if contractors figured to do competitive work just exactly as plans and specifications called for, a man would not get 'one job in fifty.' Now, if this is true, and personally I believe it is, there is something very poor in our methods. . . ."

From his discussion Mr. Wright draws the conclusion that a better method of estimating quantities is necessary — but is it? Let us grant that it is essential to the well-being of the general contracting system, but is that system necessary to the business of building?

Mr. Wright says that "it must be obvious that no amount of figuring can reduce the real quantity of material which a building will take."

Certainly "figuring" will not do this, yet there may be considerable variation in the amount of material consumed by different constructors for similar work, and there will be still more difference in the amount of labor as directed by different foremen.

The truly obvious fact in estimating is that no one can accurately forecast how much a building will cost, therefore those who attempt to compete for the privilege of undertaking such work at a contract figure indulge in gambling, pure and simple, just as do those foolish architects who enter informal competitions.

Probably a good reason for the lack of business method prevailing in contractors' bidding is that many have learned that they can arrive as closely at the actual cost of a proposed structure by comparing it cube for cube with a similar building of known value as by taking off the actual quantities; and, furthermore, the purpose of contractors' estimating is not so much the ascertaining what a structure will actually cost — that being a known impossibility — as to arrive at a safe figure that will land the job.

Assuming that the purpose of building is less the giving of employment to architect, contractor, and mechanics than to produce a structure for the benefit of the owner, it must then be admitted that the interest of the owner is that most to be conserved. Is he sufficiently interested in knowing the exact cost of his building *to the contractor* as to be justified in paying for a survey of quantities? He is not. He is not even willing to pay a contractor for a guaranteed estimate of cost.

He wants to know the minimum price at which any applicant will undertake to erect his building, and he wishes positive assurance — bonded guarantee — that such figure will also be his maximum expenditure when the returns are all in. But the added expense of having quantities surveyed — which contractors are supposed to do free of charge — *solely for the benefit of competing bidders* does not in the least appeal.

And the interest of the owner is the paramount interest. In countless ways it can be demonstrated that the interests of the building contractor are not those of the owner, nor of his confidential agent and adviser, the architect. Whether quantity surveying be necessary to the proper fortifying of the business of the contractor, or whether it be frankly admitted that contracting under the competitive bidding system is simply gambling to be freely indulged by the shyster or broker as well as by the skilled builder, we can plainly see that there is in the whole general scheme a lack of conservation of the best interests of the owner.

This has been distinctly discernible for some time to many of the leading men in the architectural profession. It was considered sufficiently serious for the American Institute of Architects to appoint a committee to report on the subject, which was done at a session of the Fortieth Annual Convention of the Institute, Jan. 8, 1907. If space permitted, this report would bear reprinting in full, but the gist of the subject is contained in the following excerpts:

"The question — relation of architects to the contracting system — is of such importance that it appears proper to call your attention to the following facts:

"Some fifteen or twenty years ago it was the usual custom to get proposals from the heads of various trades and to award a number of separate contracts for the work of one building. . . . As building construction became more complex there arose a desire to place the work of these various trades under one general contract, and the idea had some advantages to commend it. It was found in practice that at times, with a number of minor contractors at work in one building, there were moments of friction, interference, and delay. Sometimes the minor contracts did not join each other exactly and then an extra bill had to be incurred to complete the structure. Therefore it seemed desirable to put all the work under one general contractor, who would be solely responsible for the whole building and for items which might have been overlooked in minor subdivision. This system appeared to have many advantages, among others, in avoiding the difficulty of telling your client that you were not omniscient and omnipresent. . . . But in this respect the alleged advantage was more apparent than real, for, as you all know, the general contractor was just as keen to take advantage of any defect in your specification as were the minor contractors, and general clauses intended to bridge the gaps proved to be without binding force.

"Then there seemed to be another advantage when the general contractor went to the structural steel concerns and got drawings of trusses or beams that you had not the time or the opportunity or inclination to prepare yourself. At any rate, we were willing to accept what seemed an

easy way, by attempting to unload the whole responsibility on one firm. But by this the general contractor has become the arbiter of the building trades. . . . This setting up of the general contractor has resulted in the great building corporations of the present time. They have been able to force the sub-contractor to a lower price, consequently they have introduced a lower grade of work, and have succeeded in keeping the architect at arm's length from the man who does the work.

"In public work it is a frequent occurrence that a general contractor is a mere building broker who assembles a lot of sub-bids or guesses at the cost, and takes the contract, beats down the prices of sub-contractors, and attempts to carry on the work without any of the skill and power of direction which makes the fully competent general contractor valuable in works which are to be erected rapidly. Where this evil occurs, the architect is forced to perform in his office a large part of the duty for which the general contractor receives pay. The general contractor receives from 5 to 15 per cent of the cost of the building with practically no expense, with profit guaranteed by sub-contracts, and protected by bonds given by sub-contractors and operating on *their* capital.

"The great promoting and building proposition grows up by introducing the method of competition that relies entirely upon the *price* and seldom upon the *quality*. Strive as you will, you cannot bring about a better state of affairs, so long as you have the general contractor whose interests are, as a rule, monetary and seldom or never æsthetic or even constructional.

"When a building corporation has grown great it assumes to control the situation. In New York and possibly in all our large cities, it may be truthfully said that not one in twenty of the important buildings, that is, such as cost a half million dollars and upward, are handled by private enterprise or are under the control of the architect as they formerly were. The building company employs the architect and assumes to control his design, and very largely does. And the man who opposes that system must find his opportunity in some other direction — certainly not in building important commercial buildings. The building company will be supported by the finance committee of the life insurance company that floats the loan and handles the stock and bonds. Ultimately the building company falls into the hands of a financial man, or, oftener, of a finance committee, none of whom has any practical knowledge of building.

"Such corporations say: 'Come to us; let us design your work; we will employ this architect in our own way and guarantee the results, and we are such large buyers of steel that we get rebates and opportunities of rapid shipment and can do better than the architect can do.'

"This seems to your Committee a most extraordinary situation and one that merits your serious attention. We see no reason for supporting a system which is uneconomic, which is disastrous to our business interests, destructive to our professional relations with our proper clients, and absolutely damning to our art.

"In our present judgment there may be times when we should advocate the employment of a general contractor, but, as a rule, it should be the sentiment of the architects of the country *to deal with the men that do the work*.

"When this body is ready to take its proper place, and courageously discuss these questions of economics relating to the art and business of building in this country, we will be respected accordingly."

In order that those ideas might receive the formal sanction of the Institute, a committee was appointed to draft resolutions which, being offered at a subsequent session, were unanimously adopted as follows:

"Whereas, the existing condition outlined by the Report of the Committee on the Relation of Architects to the Contracting System is one which menaces the entire architectural profession, and if carried to its logical conclusion would make impossible the honorable practice of architecture, therefore be it

"*Resolved:* That this Report be adopted as expressing not alone the ideas of the members of the Committee, but as well the convictions of the American Institute of Architects in convention assembled."

All of which was said and done ten years ago — and mostly forgotten. But the condition which was described and deplored can hardly be forgotten. It is ever too painfully present.

And why?

Of course, the answer is that the general contract system is the simplest one for an architect to handle. With it goes the added employment of the architect as superintendent and the additional fee as well. Without it, the owner is too often convinced that the entire service of the architect can be dispensed with.

And there's just the rub; it can.

Mr. Sturgis, defining "Contract," takes occasion to step aside from the limited path of the lexicographer and to remark, editorially, that "it is probable that there will be no great improvement in the artistic results of architects' practice until the commission system is done away with, and until architects are paid by salary or by lump sum. This improvement can hardly be made, however, under the contract system. The two seem to belong together; the architect, being recognized in the contract as an essential third party to that contract, is naturally paid by a percentage on the amount of money represented in the contract.

"These considerations seem so important to many of those who have strongly at heart a return of architectural practice to older and wiser methods, that it has grown to be a common opinion that the abolition of the contract system is the first step that should be taken."

One cannot so easily see the analogy between the method of contracting and architects' fees as it can be seen that a continuance of the contract system is essential to one-third of an architect's employment and remuneration — unless architects add to their functions the actual execution of work in the field. The march of events seems headed in that direction and the "cost-plus" builder is blazing the way. It may not be long before we awake to a realization that the 10 per cent which the contractor has been exacting, theoretically, is by rights an emolument of the architect.

Now, if the architect chooses to be a lofty professional character, an artistic designer only, rather than a complete "creator of structures," why then should he not be employed either by the builder or the owner, it matters not which, to be just that designer; the actual working out of the design being left to the contractor or building

entity, their excellent draftsmen, and their field forces for carrying the work through to completion?

This is one solution, and many ethical practitioners, as well as other able draftsmen, have been so employed, sometimes furnishing designs only, sometimes more complete working drawings, the engineering and other details being left to the contractors' own forces. In fact, there probably are to-day more capable structural engineers in the employ of contractors than of architects — a condition largely due to a manifest disposition on the part of many of the best architects to leave their engineering problems to outsiders, specialists in those lines.

Perhaps it is this very assumption of high ethical professionalism on the part of the architect which has greatly assisted in giving the general contractor his ascendency in this age of intensified commercialism.

In almost any American community a man's standing is reckoned, not by his morality or mental attainments, his æsthetic instincts or artistic attributes, but by the number of dollars which he has accumulated or controls. Manifestly, then, even in those cities which do not boast enormous building-financial corporations, such builders as have capital and can give bonds guaranteeing the successful outcome of their undertakings, are of more importance in society than impecunious architects, honest and upright, mayhap, but declining to guarantee anything.

And how much worse is this condition made by many practitioners, some not wholly scrupulous in their undignified scramble for new business and their over-zealous offers of low fees and free preliminaries!

Thus, in so many instances, we behold the inversion of the intended order, the architect taking a back seat in the scheme of things, the contractor predominant.

Nor, in the natural trend of events, is there reason, except in the mind of the architect, that this should not be so. Though we live in the age of the "apotheosis of the dollar," yet we cannot help but observe that the improvement in commercial probity is apparent also in the business of building, even though it be a misfit in contracting methods. The better class of the building public no longer seeks solely for the cheapest building of its structures, but frequently go to those with reputations for upright dealing. Thus we often find such an owner conferring with a builder before consulting an architect, and even asking the opinion of that builder as to which architect to employ.

Now all of this is very reasonable when we consider that what the owner really wants is the best investment to be had — that he is not concerned in the perpetuation of the architect-plus-general-contractor system. Nor does he care a particle that, in first talking to his builder, he is running counter to the tenets of that system. But note the paradoxical effect of his seeking the opinion of the contractor on the subject of architectural merit.

Through wisdom gained of experience the contractor knows that, if he does recommend the architect he believes to be the best, it will be at the probable expense of losing the job. He knows that such an architect, intent on working solely in the interest of his client, will advise that client of several other contractors of about equal standing who would like to bid on the work, and that this will open the door to others, at least one of whom is quite likely to be a lower bidder than the one first consulted. He has seen a good job go a-glimmering that way aforetime, but not again. He knows another architect, not so hide bound by ethics as to prevent his manifesting substantially his appreciation of a favor rendered by returning it in kind. To him he sends his friend — not in the spirit of one betraying that friend, but fully intending to see that he gets good value for his money. For can he not, in the office of this second individual, so control the design, saving unnecessary frills, the idiosyncrasies of the "fancy" designer, as to safeguard the client in his own way, no less than would the high class architect in his?

Which combination is less to be desired — a good architect and poor contractor, or the reverse?

Thus does the second rate architect get the "edge" on his highbrow competitor. And again is it exemplified that the strictly ethical architect cannot work hand in hand with the contractor in the interest of their mutual employer. Is this as it should be? In the evolution of a building should not all concerned labor together for the good of that building and its owner?

But there is another way for the contractor to answer the query of his prospect without running the chance of losing him. This contractor is as clever as he is honest. He has seen good work go too often to the cheap and undependable shyster or the ignorant low bidder, and even from the offices of the best architects. He conceives that it is no longer incumbent upon him to back up such a system, and he revolts. He has for some time maintained a drafting room in which, under the guise of "shop drawings," he has made all the details for those of his jobs presided over by the cheaper architects. He takes but one further step and is then prepared to say to the owner: "Don't pay a fancy fee to an architect. You don't need to. You know Brown. He's been architect Smith's head man for years — been doing all his designing and getting no credit and not enough pay, until he got sick of it. I needed a man to boss my drafting room and I knew he was as good as any architect we have, so I made him an offer. I pay him ten dollars a week more than Smith did, but he's worth it. Let's just give your problem to him and we'll all work it out together and you'll only have to pay what it actually costs, plus such a commission as we can agree upon."

And is it not in this direction that modern contracting is trending?

Look into the drafting room of any large building concern — in cities of moderate size as well as the largest — and see there the evidence of a large consumption of the annual crop of architectural graduates turned out by our well patronized colleges of architecture.

Perhaps fewer of these than we think find their way into the architectural profession proper. There is even a question as to whether or not there has been any actual increase in the number of architectural practitioners in recent years. Some time ago the Minnesota Chapter of the Institute made public complaint that the inroads of the contractors and "mail order" plan factories had served to greatly lessen their clientele. Not only do the general contractors thus supplant the architect, but the sash bar manufacturers offer complete free service in remodeling store fronts, the heating concerns are correspondingly obliging in the matter of plans and specifications for heating and ventilating installations, fixture

people donate similarly the necessary details for bank and commercial interiors — even the entire structures — and so it goes.

In 1892 Sioux City, with a population of twenty-five thousand, supported seven architectural offices, numbering eight architects, of varying talents. To-day, with that population augmented to sixty-five thousand or more, there are four such concerns of six members. This condition may be considered fairly typical throughout the Middle West. Evidently the emoluments accruing to those who survive are not sufficiently attractive to draw large numbers to the field. On the contrary, investigation would probably prove that, in spite of the enormous increase in the cost of living, these architects are still practising, nearly all of them, at the rates that prevailed before the Institute attempted to increase the minimum fee to 6 per cent.

Now some of these, wiser perhaps than their brethren, and not quite such sticklers as to ethics, have discovered, in the evolution of the drafting rooms of contractors and supply houses, a perfectly simple solution of the problem of " making ends meet." They argue, and who shall say unjustly, that, inasmuch as one of the chief features of the owner's building problem is economy, as is manifest by his refusal to pay a proper fee for architectural service, then why burden him (or the architect) with dual expense for detail drawings? Thus the upbuilding of the contractor's drafting room as aforesaid. If it so be that architectural draftsmen are averse to working for contractors, the idea of special experience thus gained, plus the salve of a few dollars a week extra pay, and the knowledge that it will positively be forthcoming weekly, will do much to eradicate the aversion.

It may not be surprising in the near future, if indeed such is not already the case, to find contractors equipped with drafting forces equal, if not superior, to those of some of the architects under whose direction they have been accustomed to work.

Note. — The author will continue the discussion of the relations between architect and contractor in the following issue, with special reference to the performance of the cost plus system as it has been developed by contracting and designing firms. — Editors.



Approach to Manhattan Bridge, New York, N. Y.
Carrere & Hastings, Architects

PLATE DESCRIPTION

First Presbyterian Church, Oakland, Cal. Plates 69–71. This church is situated on a lot, 249 feet long (north to south), and, due to the obtuse angle of one boundary, its width increases from 150 feet at the south to 200 feet at the north. Two distinct branches, devotional and social, of the present-day church work are provided for in a two-part and almost equal division of the building, called, for convenience, the auditorium and the parish house. Deciding factors in the study of the plan were: an assurance of sunlight where most needed, convenience of access, the fullest effectiveness of the architectural composition, a minimizing of possible ill effects from future surrounding buildings. After full consideration there was evolved an "L" plan, of which the arm eastward near the north boundary is the auditorium, and the other arm, southward near the west line, is the parish house. In addition to an elaborate Sunday-school system and the usual retiring rooms, the parish house contains a lofty room occupying the greater part of the top floor, serving as a social hall, and equipped with motion picture apparatus. In the basement are the mechanical and electrical installations. For heating there is a battery of boilers, one large and one small unit, that the system in working may be flexible. The parish house is heated by direct steam; the auditorium has a plenum system, by which fresh air is forced through steam-heated warming coils, thence into a large reservoir space or chamber, from which it passes into the room through the five hundred or more small inlets that are uniformly distributed over the entire area of the floor. The power is secured by a large blower or rotary fan, driven by electric motor. The other apparatus installed includes a vacuum cleaner, feed pumps, hot water generator, separate organ blower, and the usual electrical equipment. The type of construction chosen is a logical one, for the section of the country in which the church was built. Precaution against the coming of earthquakes commended the substitution of the more resilient reinforced concrete. Piers, arches, walls, and floors are all of concrete, the exterior being finished with cut and tooled ashlar masonry of concrete stone. All base and belt courses, copings, window tracery, and all enrichments such as niches are made of the same material. A feature of the building, unique in the west, is its roof of rough surfaced slates, graded in size and thickness and variegated in color. The auditorium is planned with a high wide nave and low narrow flanking aisles separated by heavy piers and pointed arches. The width of the nave has been made to exceed that of any Gothic cathedral in England, except York, in order to meet the new need of bringing all worshipers within voice range from the pulpit. For the three divisions nearest the chancel arch the main piers and arches are omitted, and in their stead are great arch spans, approximately 40 feet wide, that open into north and south transepts. There is not, however, the conventional crossing or change in direction of the nave ceiling between the transepts — a plan composition more distinctive of cathedral than of parish churches; in this building the motif of heavy, rich traceried wooden trusses repeats, unvaried, the entire length. The finish of the interior is Caen stone cement, and the stone tracery of the windows, except the small ones of the aisles, is solid through to the inside. All the arches are richly moulded, the clerestory windows have decorated spandrels, and there are clustered colonnettes, separating the clerestory bays below the roof trusses. The high wainscot of the room, the gallery front, the choir screen, and richly carved organ front are all of quartered oak, as is also the furniture, pews, and pulpit. The baptismal font is a replica of an Old English one, executed in Caen stone and marble. For the choice of architectural style, preliminary studies were made not only in Gothic, but also in Spanish Renaissance. The facts were recognized that the latter best suited the climatic and physical conditions imposed, and, further, that it was in a sense indigenous. There seemed, however, a special fitness in Gothic because of its association with Old English Protestantism. Once chosen, the style was faithfully and minutely followed. This church is one of the few adventures into the field of the essential Gothic spirit on the Pacific coast.

St. Stephen's Episcopal Church, Ridgefield, Conn. Plates 72, 73. The material of the main walls and tower is uncut field stone, taken from the stone walls of the district and selected for flatness of surface. Main roofs are of fading brown slate; front porch and belfry are of white pine; exterior cornices of cypress and spire of cypress shingles, all painted white. The interior is finished with red tile aisles, pale buff plaster walls, white columns and cornices, white pews with mahogany tops and red cushions, yellow tile chancel with white marble steps and border. Pale amber glass is used in the windows. The heating is by hot air for the main church, with subsidiary hot water system for the sacristy wing and front portion of building — the latter system to be used constantly during cold weather, the hot air system for Sundays only. There is no system of forced ventilation, the foul air being taken merely by gravity from the ceiling of the auditorium to the belfry. The church accommodates a congregation of 380 people.

Athletic Club, Columbus, Ohio. Plates 74–76. This building houses an organization which is a combination of a business and social club. It has a resident membership of approximately fifteen hundred and a nonresident membership of about four hundred. In plan the problem was to provide such an arrangement as would permit of the use of the building for all of the purposes for which it was intended at the same time, without conflict between any of the parts. The building, therefore, was divided into separate units: business, social, athletic, and living quarters. The front half of the basement is devoted to the billiard room and bowling alley, these rooms being so closed in and protected by double walls and insulation as to prevent all noise reaching the ground floor. The rear half of the basement and the entire subbasement are occupied by the mechanical equipment. The ground floor is the business floor of the club, and the second the social floor. Above the second story the building is divided vertically near the center by a heavy wall which separates the athletic department, located in the rear, from the living quarters in the front section. The four upper floors in the front section contain twenty bedrooms on each floor, a total of eighty bedrooms, each

being connected with a private bath. In the four upper floors of the rear half of the building are located the plunge bath, the gymnasium, four handball courts, ample locker rooms, special exercise rooms, the physical director's office, and the Turkish bath department. The building is thoroughly fireproof throughout in its construction. The swimming pool, which is located on the fourth floor, is supplied with fresh water constantly through large filters. Artificial ventilation is provided for all the principal rooms. It was constructed just prior to the upward tendency in building material prices, and cost complete, including furnishings, less than $600,000. The material for the exterior is a red tapestry brick, the trimmings being of dark buff terra cotta.

CHALIF SCHOOL OF DANCING, NEW YORK, N. Y. PLATES 77–79. The building is designed to house the activities of the Chalif Normal School of Dancing, making provisions for classes and periodical exhibitions and for the summer classes to teachers which constitute the normal course. In addition one floor, the fourth, is arranged as a living apartment for Mr. Chalif and his family. The building is planned so that it can be rented for private social functions. The limited land area made it necessary to distribute the elements of the plan through several stories properly interconnected, making the most of the second and third floors for the regular unbroken dancing space required. The ground floor has an ample reception foyer opening on stairs and elevators; the second floor is given up to the grand ballroom, the third to a banquet hall with a nucleus of a pantry connected by a service elevator with a large catering kitchen in the basement. The gymnasium floor at the top satisfies the needs of the summer school, being all light iron and glass, with an open steel trussed roof. The big halls are artificially ventilated by tempered air, screened and washed and forced into them. A fan on the roof draws out the foul air. The building is of regular fireproof construction, heated by indirect-direct and by concealed-direct steam heat. The street front is of marble, brick, and colored terra cotta. The first story is veneered with white Dover marble carrying all around the vestibules. The upper stories are mainly faced with brick, laid in a not too evident diamond pattern. The wall has a rich, cool color, varying delicately through gray green, blue, and cream. The terra cotta is mainly cream and yellow, adding warmth to the color scheme without strong contrast. The color is heightened near the top by an orange background in the fourth floor panels and by a green background in the frieze under the projecting copper cornice. A gray green line of unglazed terra cotta follows the contour of the arched windows and outlines the brick filled space facing the second and third stories. The columns at the top have cement shafts. The sloping roof is of green Spanish tile, the leaders of copper, the grilles and lanterns of cast and wrought iron, painted a gray green. For the decorations of the interior, cast ornamental plaster and paint were freely used. The reception foyer is all of wood except the ceiling, but wood has been sparingly used in the large halls. The hangings and furniture were studied with the color schemes. Crystal chandeliers furnish the artificial light.

NEW ROCHELLE PUBLIC LIBRARY BUILDING, NEW ROCHELLE, N. Y. PLATES 80, 81. This building comprises two stories and a basement. The first floor, three feet above grade, contains a delivery room directly accessible from the main entrance; a children's room at the right, provided with an independent exterior entrance, and a general reading room with connecting librarian's and cataloguer's rooms. Back of the delivery room is placed the book stack with public entrance and exit. The stack room capacity at eight volumes per foot is 72,440 volumes. The architectural design is based upon a rather free adaptation of the Georgian period. The materials of the exterior are white marble, light colored brick, and mat glazed terra cotta, with a sparing use of color. With the exception of the doors and windows, the building is fireproof. The book stacks are of steel, and the fixed and movable furniture are of oak. The floors of the reading rooms are of cork tile, and of the delivery and reception room above buff quarry tile. The general contract was $56,807; the steel stack, $11,241; and the wood furniture, $7,466.90.

MORTUARY CHAPEL, WEST VIEW CEMETERY, PITTSBURGH, PA. PLATE 82. This building is for ordinary mortuary chapel uses where funeral services are held before burial. The building has no cellar, but a small heating room below grade provides space for a steam boiler. The loggia floor is a reinforced concrete slab, the top finish of which is red cement marked off into squares with borders carried out in tile. The brick which are laid in checkerboard pattern for the plain walls are vitrified common brick in variegated shades of red. The header border at the cornice level is the same. These brick are laid with a black joint and the remainder with a white joint about ¾ inch wide and raked ¼ inch with a carriage bolt. The coping is limestone. The outside walls are hollow to secure the deep reveals of the arches. In the reveals the brick is laid dog toothed with the corner to the face. All roofs are built of heavy yellow pine framing with the timbers exposed. All the wood trim is cypress stained dark. For the roof of the auditorium, tongued and grooved sheathing was laid on trusses and purlins in herringbone pattern, and decorated with pure transparent colors somewhat in Byzantine manner. The building cost in 1912, $10,000, exclusive of decorations and furniture.

HOUSE OF W. A. HENDRICKSON, ESQ., RIVERTON, N. J. PLATES 83, 84. This house was planned for a moderate sized family and designed in a way to avoid the effect of congestion, but at the same time with no extravagant result. The first floor afforded the only opportunity for any architectural effect, and there the thought of the rather informal English home was adapted to produce an atmosphere altogether desirable in an unpretentious home. The exterior walls of the building are of dark red rough brick with darker headers laid with Flemish bond, except that, instead of having the header between each stretcher brick, it occurs between each two stretcher bricks, with the mortar between the stretcher bricks colored to match the brick. This produces the same effect as using the Roman size brick, but without the attendant expense. Graduated green and purple slate was used for the roof covering. All of the joists throughout the building were supported either on brick walls or on structural steel frame, and after several years of use this method has successfully prevented the shrinkage cracks ordinarily encountered in new buildings. The cost, including heating, plumbing, and electric wiring, was approximately $25,000.

EDITORIAL COMMENT AND NOTES FOR THE MONTH

A GOOD many architects have a tendency to fall in too readily with the condition we call business depression, and quietly wait for "bad times" to become better, the meanwhile deploring the timidity of actual or prospective clients, yet doing nothing to influence opinion or improve matters. This attitude is in direct contrast to that which they should display. Architecture is a creative force, and architects should assume the rôle to which their profession entitles them. The architect is given the power to visualize, and this great advantage should be used in a constructive capacity. He should not be content to follow conditions as others make them, but by the very nature of his profession he should be a moulder of opinion and himself a maker of conditions.

With the entry of the United States into the world war, it was only inevitable and natural that the architect would encounter timidity on the part of clients occasioned by uncertainty as to future happenings. This should not be a signal that building operations have come to an end or that the profession of architecture should go into retirement till peace has been declared and our daily routine restored to its normal, comfortable pace. It should be the opportunity for the architect to rise to the full height of his power and give constructive evidence of his ability.

This country is not having a period of business depression and from present indications it will not likely experience one. It has, however, taken on a serious, determined air that indicates a hearty intention of seeing the present duty through with the utmost speed and efficiency, and at the same time with the least interference to general business. With the realization that we must feed, clothe, and supply with munitions the greater part of the world, has come a sense of the obligation resting upon us to engage in no work excepting that of a purely productive character. This sentiment is undoubtedly entering into the consideration of building operations, but it need act as no detriment to architects; rather should it prove a decidedly advantageous opportunity. Some types of building are without doubt correctly placed in the class of luxuries, but the great majority of the types that architects are called upon to build are always necessary and of even special need at this time. The energy and money that in other times would be appropriately expended in the erection of public buildings, museums, etc., may now be put to much better use in constructing buildings that will aid in developing the country's production. Private building may also be somewhat curtailed, but for this *possible* curtailment there is a *certain* increase in all types of industrial building.

The abnormal demands which are being placed upon American manufacturers mean that they will need to double and treble their output, at the same time expand their plants and recruit thousands of new workers. These manufacturing centers will require a solution of the housing problem which is presenting itself to every one of them with undoubted force. This constitutes in itself not only a specialized problem for the architect, but a fine architectural opportunity as well. Object lessons from Europe have gradually told their story to large employers of labor in this country, and while it is true that for many years progressive architects have known and preached the advantages resultant from proper housing, their words fell upon deaf ears, as far as the manufacturers were concerned. Conditions, however, have now materially changed, the American manufacturer realizes to-day that to obtain a good quality of labor and to inspire loyalty and efficiency in his operatives he must provide them with comfortable, sanitary, and attractive living conditions. With the great barrier of indifference to the problem removed, it remains only for the architect to devote constructive thought to the economic and æsthetic solution of the need for such improvements to take place as will revolutionize American industry. The problem of housing the industrial worker is the one big consideration to-day before the manufacturer and the architect, and it presents a special opportunity for the architectural profession to align itself with a great economic movement.

Not all of the necessary building, however, will be confined to industrial work. The inevitable expansion which will come through the enlarged sphere of this nation's influence will require much necessary private building, both commercial and residential. The architect may, however, well ask: "What of that all-too-familiar individual, the man who needs to build but feels he will be wiser to 'wait until conditions are more settled' before he goes on with his building project?" "Conditions," after all, are largely what this man and a few hundred thousand like him are timid enough to make them. The very thing which they individually deplore is a creation and figment of their own collective weakness. The application of a little constructive psychology, directed and charged with sound judgment, forceful personality, and strong confidence, will go far to offset this temporary nervousness on the part of clients. "Business as usual" may be (as some English people found it) a damaging fallacy if used merely to inflate unwarranted optimism, but certainly any tendency toward the general suspension of business is a policy not only detrimental, but actually destructive, and hence unpatriotic.

Let the architect exert all his power toward the strengthening of general confidence and against any tendencies which reflect unfounded timidity. Let him also, at this time of intense co-operation among all the citizens of this nation, expect more from himself; let him see the part he may play in meeting present problems. Every American architect to-day should be conscious of his true relation to the industrial world, especially in the realm of the building trades, and should be fired with a convincing patriotic zeal to keep architectural activity alive through every means in his power, be his project large or small.

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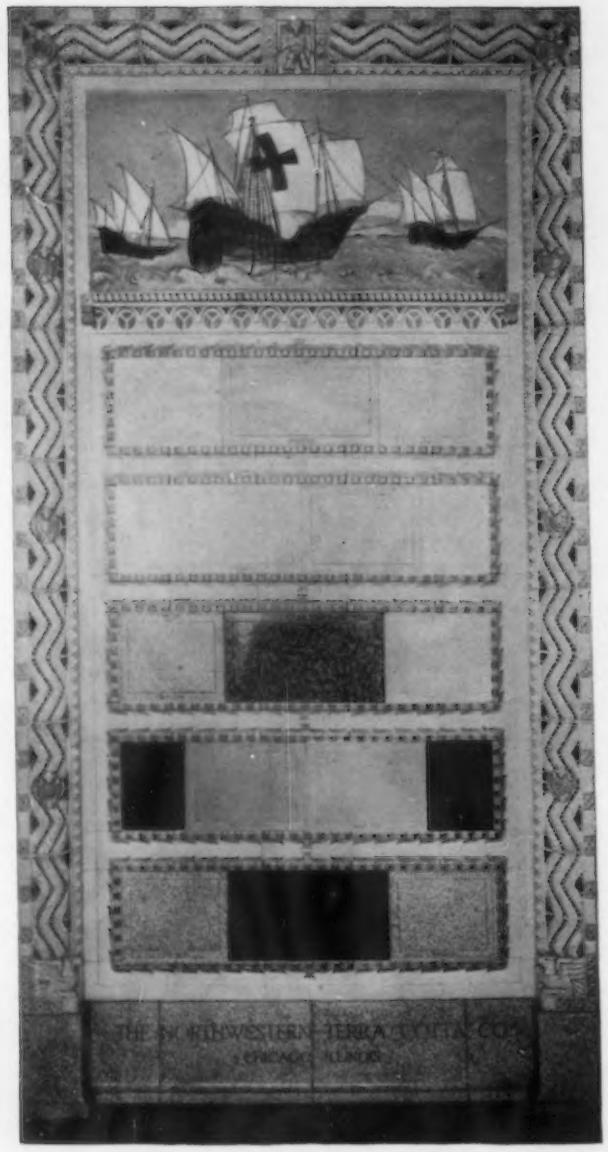
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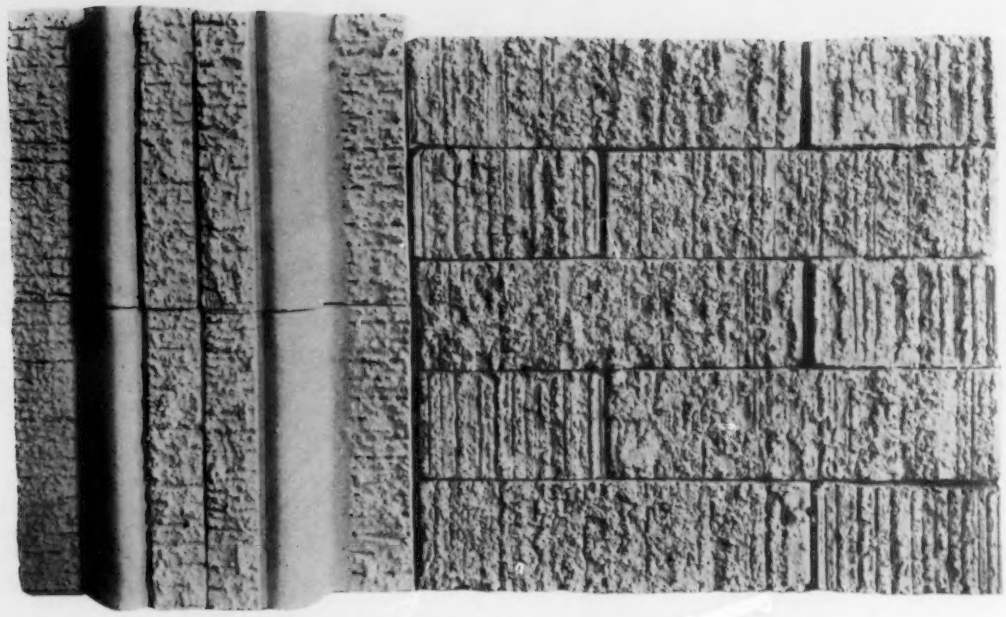
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Architectural Terra Cotta *of* New Colors and Textures



Panel of Face Brick and Architectural Terra Cotta Trim with Similar Texture Surfaces

With the wide use of Texture Bricks why should ARCHITECTURAL TERRA COTTA not be made of like color and finish?

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Builders



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standard
TERRA COTTA

to match aged limestone

John W. McKecknie
Architect

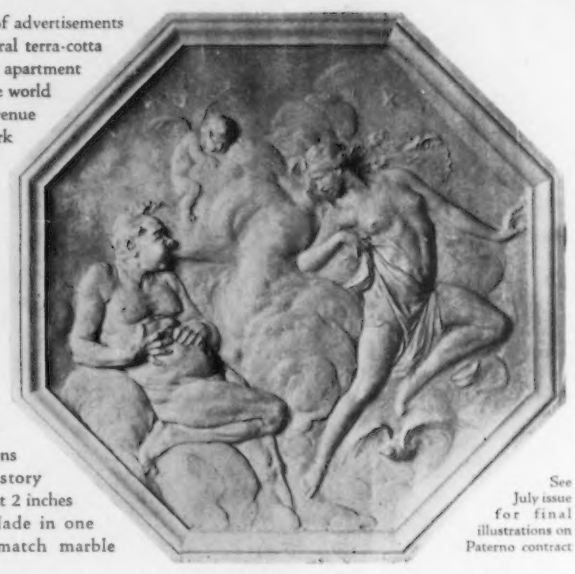


The second of a series of advertisements illustrating architectural terra-cotta used in the largest apartment building in the world
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New York



See May issue for other illustrations on Paterno contract

Two medallions at second story of court. 3 feet 2 inches in diameter. Made in one piece. Color to match marble



See July issue for final illustrations on Paterno contract

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1887 1917

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ALL Terra Cotta trim to exterior of this church is of vitreous gray color tooled six cut to the inch.

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Magaziner & Potter, Architects



Pilaster Capital, Nicetown Branch Free
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John T. Windrim, Architect



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WASHINGTON, April 27.—The Allies of the United States need ships, food, munitions, and money from this country, and the faster they are supplied the quicker the war will end. This was brought out forcibly today, when both the French and the British missions began in earnest their conferences with the officials of the American government, laying before them in the Allies needs and such and suggestions as to for the United States requirements

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AMONG the many factors which influence architecture, climate, race, social conditions, religion and available materials may be mentioned. Of all influences, climatic conditions are the most obviously direct, and climate should be the first big factor in determining the type of roof.

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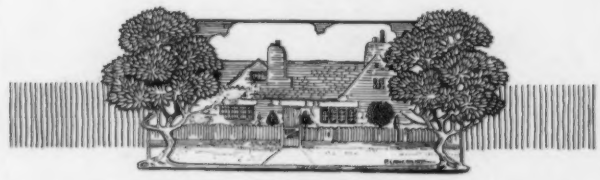
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IN RED, BUFF, GRAY, MOTTLED, WHITE, ETC.

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Tampa, Florida
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are faced with smooth silver gray
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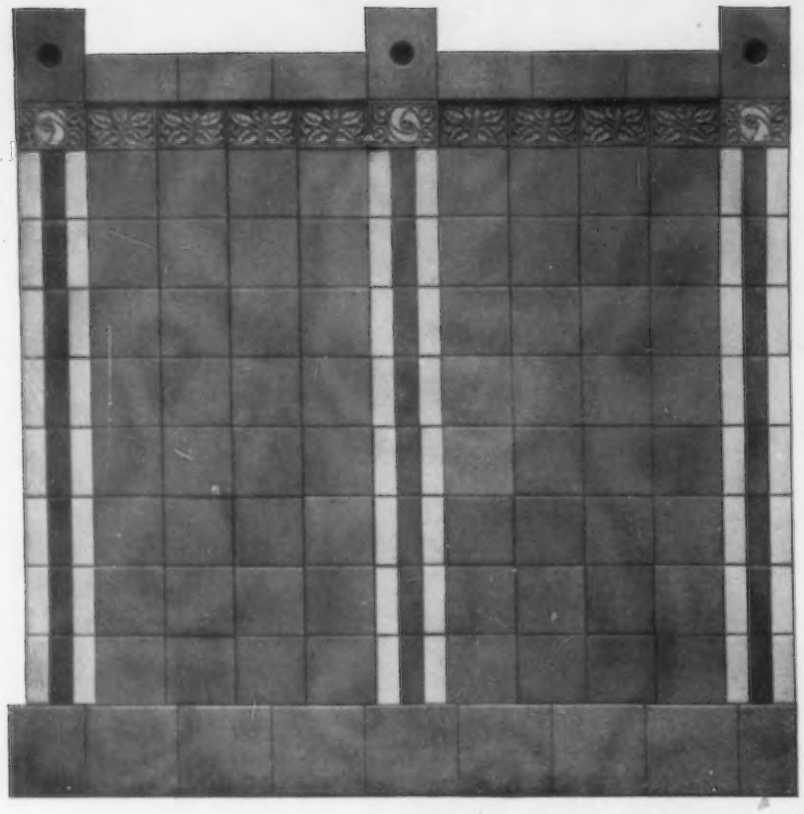
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Wm. F. Behrens, Decorator

ROOKWOOD
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WAINSCOT
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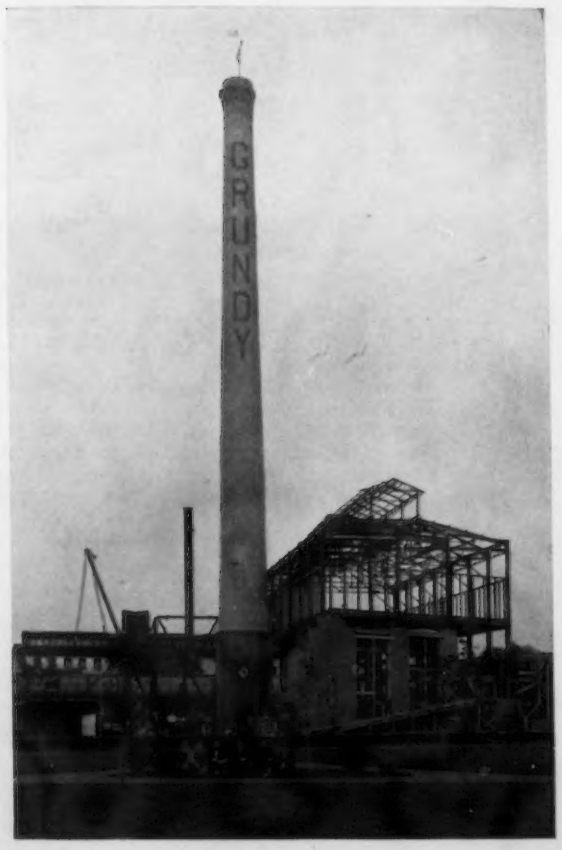
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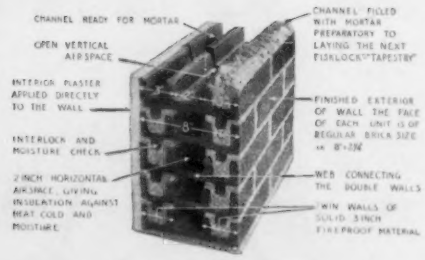


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meet the requirements of discriminating architects and owners—of those who demand grace and beauty along with practical service. These baths are typically "Standard" in that they represent that spirit of progress which has characterized the career of this company.

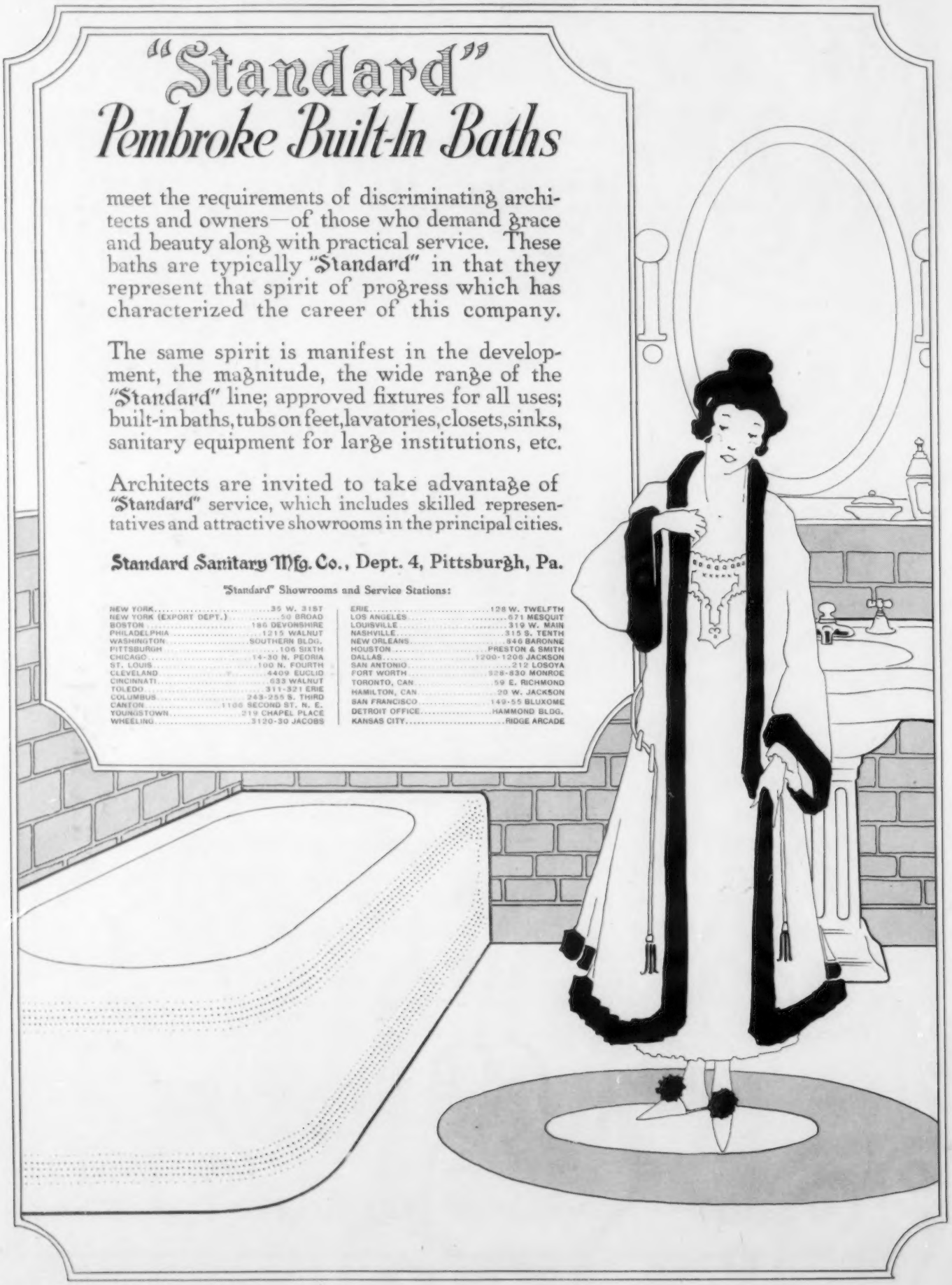
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KANSAS CITY	RIDGE ARCADE





America builds back to Permanency

HIGH up in the pockets of great cliffs, sheer above the dangers of life thousands of years ago, our American predecessors lived in permanent buildings. Here they were free from the awful forest fire, the lurk of beasts and the treachery of fever-laden air.

For entirely different reasons but with equally good judgment, modern America has moved back into the permanent building. Structurally, we have found ourselves. Our cities have staked their claims once for all and have set about to make building history that will not pass like the Red Man's wigwam. We have learned a lesson from the age of inflammable materials just past, which from log cabin to Queen Anne Mansion has gone—leaving a blot on the pages of building history.

Concrete, Steel, Stone, Masonry and Asbestos—these materials have focused thought on building permanency. The first four have given us the permanent building. Asbestos has topped it all with a lasting, mineral, stone roofing that repels fire and resists the ravages of time.

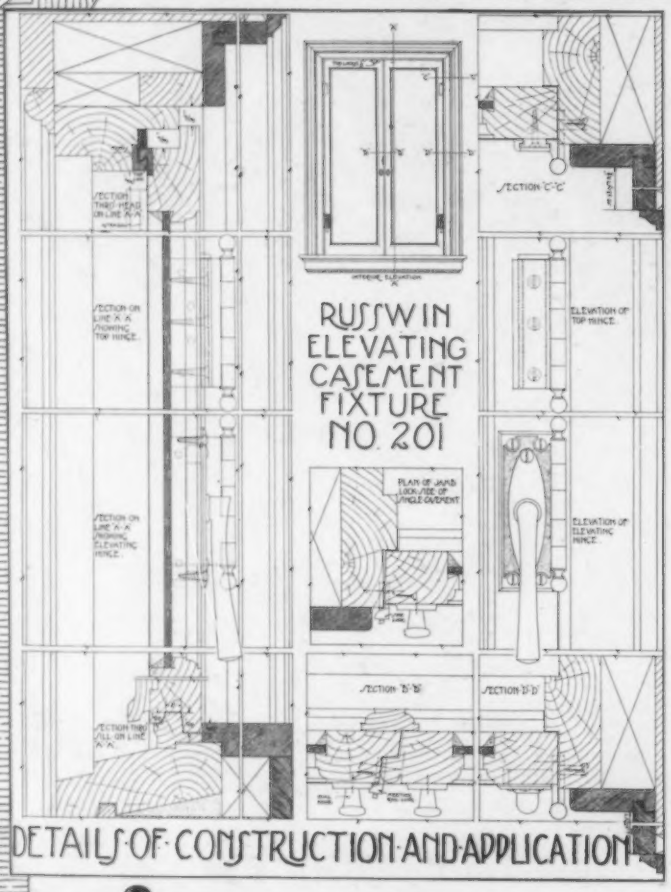
Nor is Johns-Manville Asbestos restricted in its application to the pretentious building of steel, concrete or stone. Its use as a roofing is reaching out everywhere*—to the farm, the home and the out-building. Here, too, its lasting power is a protection against fire, rot and disintegration. It is America's safest and most economical roofing.

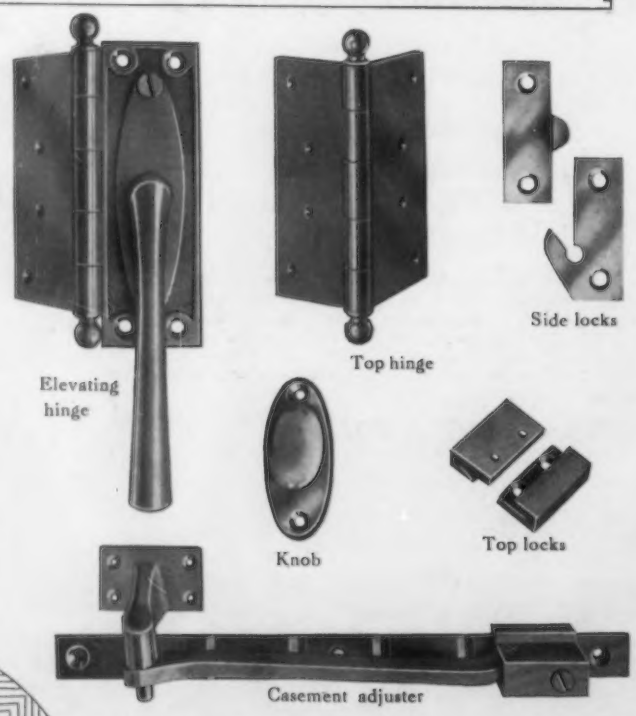
H. W. JOHNS-MANVILLE CO.
NEW YORK CITY
10 Factories—Branches in 55 Large Cities

**Johns-Manville Asbestos Built-Up Roofing for flat roofs; Asbestos Ready Roofing for sloping surfaces; Transite Asbestos Shingles for the home; Corrugated Asbestos Roofing for skeleton frame structures. Johns-Manville Mastic Flooring, Waterproofing, Asbestos Siding, Transite Asbestos Wood, Keystone Hair Insulator.*

JOHNS-MANVILLE SERVICE COVERS THE CONTINENT

JOHNS-MANVILLE
Building Materials





RUSSWIN Elevating Sash Fixtures

Formerly made by Tabor Sash Fixture Co.

Approved and adopted by the supervising architect of the Treasury Department for use on casement sash in Federal Buildings.

For use only on specially constructed sash, vertically hinged and opening in or out.

The lever operating handle raises the sash ½ inch and in the same operation unlocks it at top and side. It is so arranged that the sash can not be lowered while in an open position.

Advantages

Sash hung with these fixtures are absolutely weather-proof. The fixture draws the sash down, as well as elevates it, locking plates at both top and center, making absolutely tight joints all around.

By the use of this type of fixture, sash is absolutely burglar proof as they cannot be forced or jimmied from the outside.

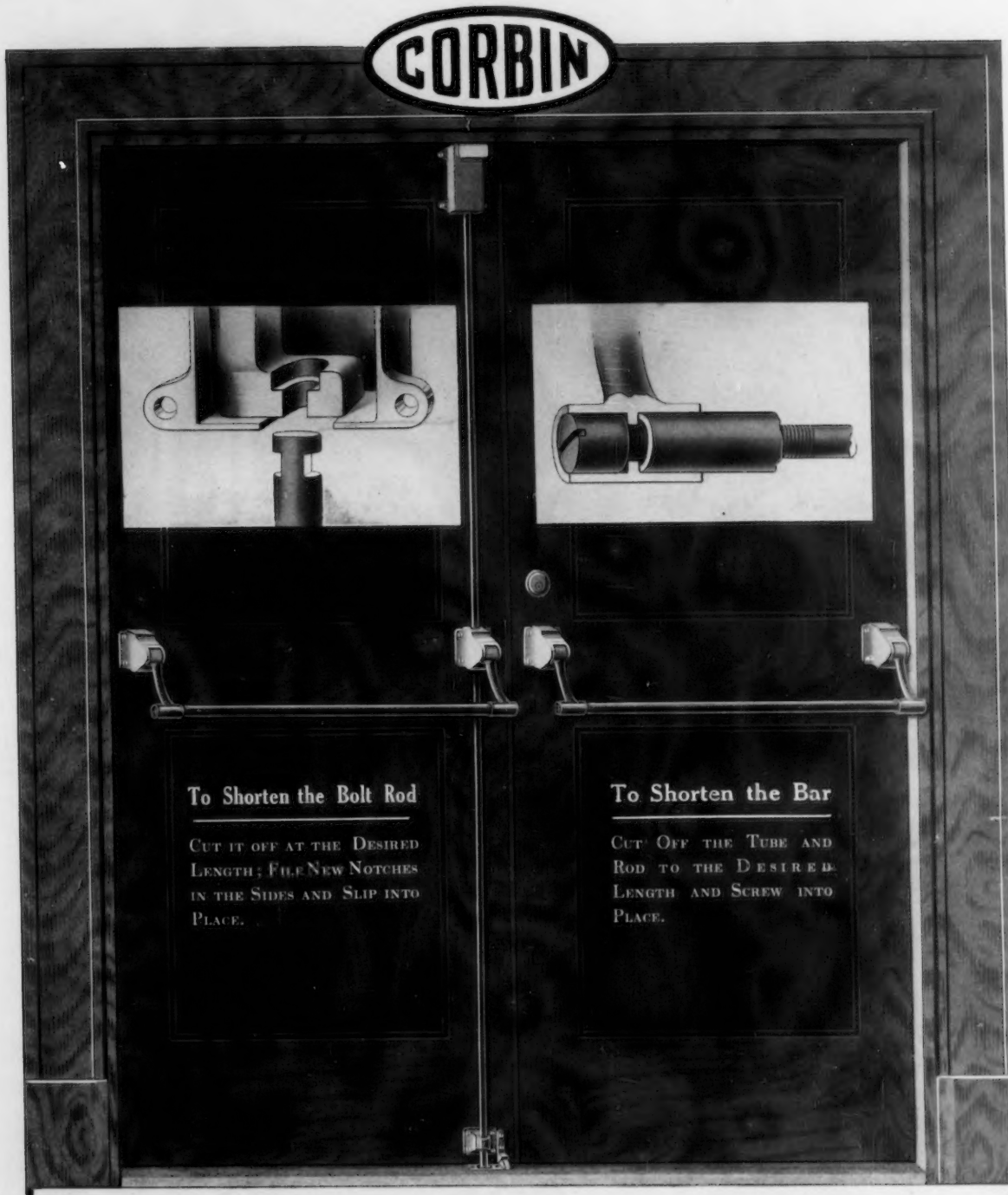
Catalog and full information will be sent on request

RUSSELL & ERWIN MFG. COMPANY

The American Hardware Corporation Successor

New Britain, Conn.

New York San Francisco Chicago
London, England



OUR NEWEST EXIT FIXTURES

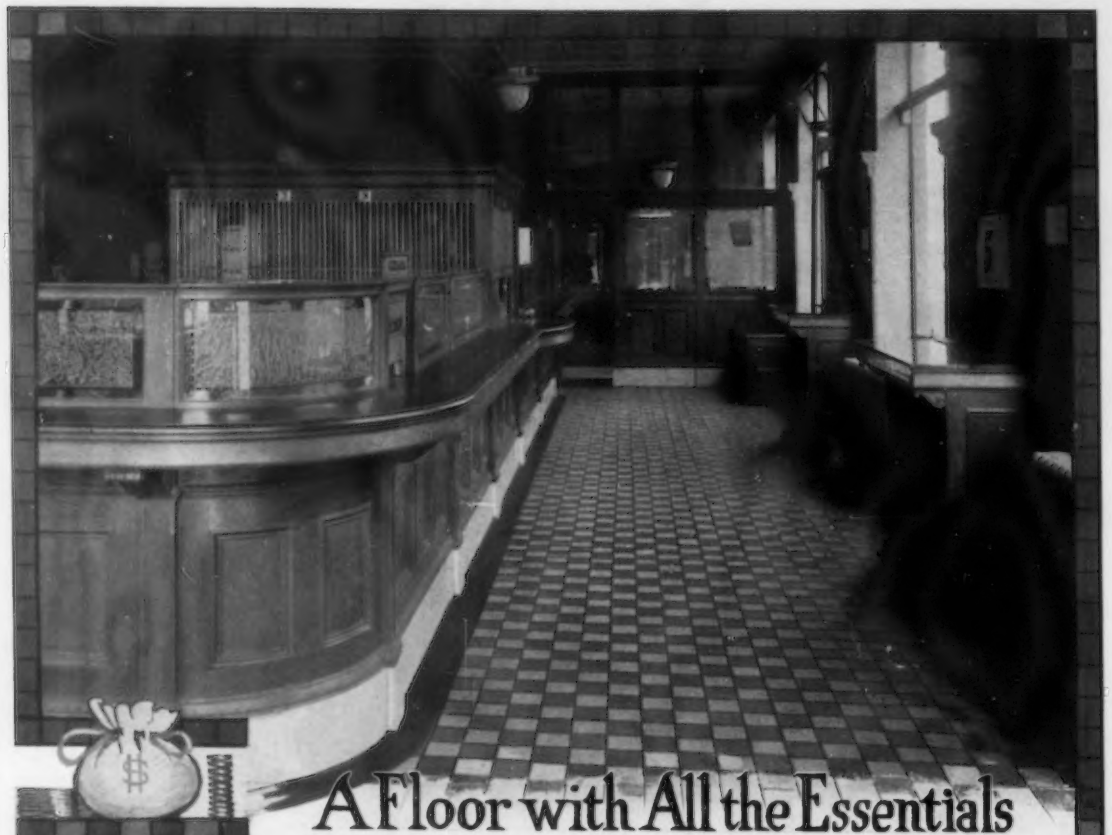
are simple in construction, made to sell at popular prices, and thoroughly reliable. They can be carried in stock in regular sizes, and cut to desired lengths on the job, for special requirements. Easy to apply, cannot get out of order, and fulfill the most strict legal requirements. Write for information.

P. & F. CORBIN

The American Hardware Corporation, Successor

NEW BRITAIN, CONN.

NEW YORK CHICAGO PHILADELPHIA



Linotile floor in Lambton Loan and Investment Co., Sarnia, Ont. The field is made up of 4-inch squares of light green and dark brown Linotile. A dark green border completes the design. Russell W. Soper, Architect, Detroit

A Floor with All the Essentials

WHERE many eyes see and many feet tread, the floor problem becomes doubly complex. Art and durability are essential, while comfort is imperative. To provide this ideal combination, discriminating architects specify

LINOTILE

Reg. U. S. Pat. Off.

"The Floor That's Built to Fit the Room"

Its eleven mellow colors permit flexibility in design and exacting tone variation. Actual installations prove that Linotile will withstand the wear of innumerable feet. And its resiliency assures foot comfort. In short, this combination of powdered cork, wood flour, linseed oil, various gums and pigments has all the advantages without the disadvantages so common in other floors.

Samples and specimen specifications will be cheerfully supplied without cost or obligation. Experienced designers are also at your service without charge.

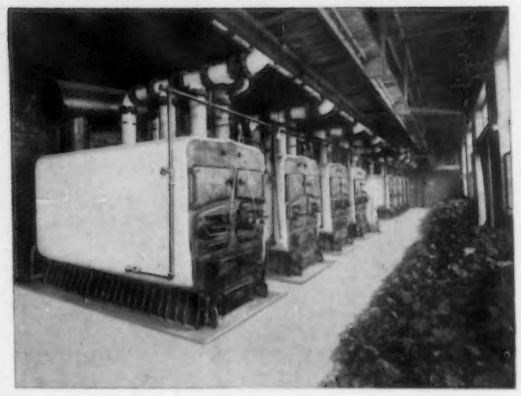
Armstrong Cork & Insulation Company

132 Twenty-fourth Street, Pittsburgh, Pa.

Also manufacturers of Nonpareil High Pressure Covering for steam lines; Nonpareil Insulating Brick for boiler settings, breechings, etc.: Nonpareil Corkboard Insulation for refrigerated rooms; Nonpareil Cork Machinery Isolation for deadening the noise and vibration of motors, fans, pumps, etc., and Circle A Cork Brick for horse and cow stalls

Smokeless heating boilers which burn cheap soft coal

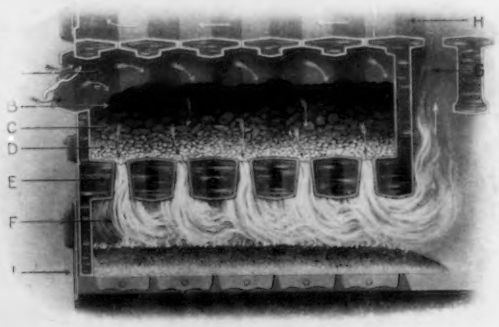
For factories, warehouses, hotels, etc., in districts where soft coals are plentiful and low in price IDEAL Smokeless Down-Draft Boilers will prove a big factor in cutting down overhead expenses.



Battery of eight IDEAL Smokeless Down-Draft Soft Coal Boilers in Curtiss Aeroplane Factory at Buffalo. Self-contained; no brick-setting. Burns soft coal without smoke.

IDEAL Smokeless Down-Draft Boilers

Save on the coal bill and give plenty of heat



Cut-away view of the side of an IDEAL Smokeless Down-Draft Boiler, showing ample gas-spaces through the water grate, and the processes of smokeless combustion of soft coal between the double grates.

are made of everlasting cast-iron, outwear steel boilers many years. Meet all requirements of smoke ordinances. Easy to run and clean. Tested in the leading soft coal markets for past five years and approved by all Smoke Inspectors.

Ask for catalog "Ideal Smokeless Down-Draft Boilers"—and let us refer you to present installations of these famous boilers—to know first-hand about their cleanliness and economy.

AMERICAN RADIATOR COMPANY

Sales branches and showrooms in all the large cities

Selected List of Manufacturers' Publications

FOR THE SERVICE OF ARCHITECTS, ENGINEERS, AND CONTRACTORS

The publications listed are the most important of those issued by manufacturers represented in the advertising pages of THE ARCHITECTURAL FORUM. They may be had upon direct application to the manufacturers.

ARCH CONSTRUCTION, TIMBREL TILE

Guastavino Co., R., Fuller Building, New York, N. Y.
Portfolio. 10½ x 13½ in. Plates.

BRICK

American Enameled Brick and Tile Co., 52 Vanderbilt Avenue, New York.
Enameled Brick. Catalog. 6 x 9¼ in. 25 pp. Color plates.

Claycraft Brick Co., 907 Hartman Building, Columbus, Ohio.
Booklet. 6 x 9 in. 39 pp. Plates showing examples of work.

Fiske & Company, Arena Building, New York.
"Fisklock"—"Tapestry" Brick. Catalog. 8 x 10½ in. 32 pp.
Tapestry Brickwork. Catalog. 8 x 10½ in. 47 pp. Color plates.

Hydraulic-Press Brick Co., St. Louis.
Bonds and Mortars in the Wall of Brick. Treatise on brick design. 8½ x 11½ in. 27 pp.
Brick Scales and Tables. Fifteen scales for vertical and horizontal measurements, with explanatory booklet and tables. 8 x 10 in. 32 pp.
Moulded and Ornamental Brick. Catalog. 4½ x 6¼ in. 140 pp.
The Hy-tex House of Moderate Cost. Booklet. 8 x 10½ in. 100 pp. 80 sketch plans and elevations.
The Brick Church and Parish House. Book of designs with floor plans from drawings submitted in competition. 10¾ x 13½ in. 80 pp.

Sayre & Fisher Co., 261 Broadway, New York.
Brick — Enameled and Front. Catalog. 6 x 9 in. 24 pp. Color plates.

Western Brick Co., Danville, Ill.
Where Western Face Brick Were Used in 1914 and 1915. Booklet. 4½ x 6 in. 31 pp.

CEMENT, PORTLAND

Atlas Portland Cement Company, The, 30 Broad Street, New York.
Handbook and Treatise. Concrete in Factory Construction. 6½ x 8¼ in. 250 pp.
Early Stucco Houses, with modern stucco specifications. Booklet. 8½ x 11 in. 24 pp.
Choosing the Garage, describing actual construction. Booklet. 8 x 10½ in. 26 pp.
Commercial Garages, with construction notes and architectural treatment. Booklet. 8 x 10½ in. 12 pp.
Color Tones in Stucco. Booklet with colored plates. 8½ x 11 in. 24 pp.

Lehigh Portland Cement Co., The, Allentown, Pa.
Forty-one Concrete Reasons. Booklet. 6 x 9 in. 34 pp.
Cement Facts. Booklet. 5¼ x 6¾ in. 18 pp.
The Expense-Proof Farm. Booklet. 6 x 9 in. 100 pp.
Lehigh Portland Cement. Illustrated. Booklet. 8¼ x 12½ in. 42 pp.

Sandusky Cement Co., The, Dept. S., Engineers Building, Cleveland, Ohio.
Medusa White Portland Cement. Booklet. 8½ x 11 in. 52 pp.
Medusa Waterproofed White Portland Cement. Booklet. 6 x 9 in. 20 pp.
Medusa Waterproofed Gray Portland Cement. Booklet. 6 x 9 in. 20 pp.

CHIMNEYS

Heinicke, Inc., H. R., 147 Fourth Avenue, New York.
Chimneys. Bulletin. Methods of construction.

CONDUIT

National Metal Molding Co., 1113 Fulton Bldg., Pittsburgh.
Handbook on National Metal Molding. Complete details and installation instructions. 4¼ x 6 in. 96 pp.
Report of Tests and Complete Data on Sherarduct Sherardized Rigid Steel Conduit. Treatise. 6 x 9 in. 31 pp.

Ric-wiL Company, The, 666 Guardian Building, Cleveland.
Ric-wiL Method. Handbook. 6 x 9 in. 40 pp.

CONSTRUCTION, FIREPROOF

General Fireproofing Co., The, Youngstown, Ohio.
Fireproofing Handbook. 6 x 9 in. 112 pp.

CONVEYORS, GRAVITY

Otis Elevator Company, Eleventh Avenue and 26th Street, New York.
Otis Gravity Conveyors. Catalog. 6 x 9 in. 56 pp.

DOORS, WINDOWS, AND TRIM, METAL

Dahlstrom Metallic Door Co., 88 Blackstone Avenue, Jamestown, N. Y.
Safety First for Schools. Booklet regarding fireproof equipment for schools. 3¼ x 8½ in. 12 pp.
Safety First for Hospitals. Booklet regarding fireproof equipment for hospitals. 3¼ x 8½ in. 16 pp.
Buildings as They Should Be. Booklet. 7½ x 10½ in. 44 pp.
The Finishing Touch in Fireproofing Your Building. Booklet. 3¼ x 8½ in. 20 pp.

Detroit Steel Products Co., 2517 East Grand Boulevard, Detroit, Mich.
The Fenestra Line. Catalog. 8½ x 11 in. 15 sections. Blue prints.

Lupton's Sons Co., David, Witt and Tulip Streets, Philadelphia, Pa.
Lupton Service and Products, No. 9. Descriptive catalog with drawings and data for specifications. 8½ x 11 in. 100 pp. and cover.

Merchant & Evans Co., Philadelphia.
Red Book. Catalog. 5½ x 8¼ in. 190 pp.

Trussed Concrete Steel Co., Dept. S-64, Youngstown, Ohio.
United Steel Sash. Catalog. Details and specifications. 8½ x 11 in. 128 pp.

DUMBWAITERS

Sedgwick Machine Works, 182 Liberty Street, New York.
Dumbwaiters and Elevators in Modern Architectural Practice. Booklet. 4½ x 8¼ in. 15 pp.

ELECTRICAL EQUIPMENT

Hart Mfg. Co., Hartford, Conn.
"Diamond H" Switches and Receptacles. Descriptive booklet. 4 x 8¼ in. 24 pp.

ELEVATORS

Otis Elevator Company, Eleventh Avenue and 26th Street, New York.
Otis Electric Traction Elevators. Bulletin. 6 x 9 in. 28 pp.
Otis Residence Elevators. Bulletin. 6 x 9 in. 16 pp.

Sedgwick Machine Works, 182 Liberty Street, New York.
Selecting an Invalid Elevator. Booklet. 4¼ x 8¼ in. 8 pp.

ESCALATORS

Otis Elevator Company, Eleventh Avenue and 26th Street, New York.
Otis Escalators. Bulletin. 6 x 9 in. 36 pp.

FAIENCE, ARCHITECTURAL

Rookwood Pottery Co., Cincinnati.
Faience Catalog with portfolio of plates. 9½ x 12½ in. 64 pp.

FLOORING

Armstrong Cork & Insulation Co., 132 24th St., Pittsburgh.
Linotile Floors. Book. 6 x 9 in. 32 pp.

Master Builders Company, The, Cleveland, Ohio.
Master Builders Standard Specifications. 4 x 8 in. 8 pp.
Saniseal Liquid Concrete Floor Hardner. Descriptive booklet and directions. 3½ x 6¼ in. 8 pp.

Sonneborn Sons, Inc., L., Dept. 4, 264 Pearl Street, New York.
Lapidolith Specifications. Booklet. 8½ x 10½ in.
Scientific Investigation of the Action of Lapidolith on Concrete by Prof. R. J. Colony. Booklet.

GLASS CONSTRUCTION

Berger Manufacturing Co., Canton, Ohio.
Berger's Radiant Sidewalk Lights. Catalog T. F. 8½ x 11 in. 42 pp.

Keppler Glass Constructions Inc, Architects Building, 101 Park Avenue, New York.
Bulletin No. 126. 8⅞ x 11½ in. 12 pp.
Bulletin No. 202. 9 x 12 in. 6 pp.
Bulletin No. 203. 9 x 12 in. 4 pp.
Bulletin No. 205. 9 x 12 in. 6 pp.

Lord & Burnham Co., 32 East 42d Street, New York.
Some Greenhouses We Have Built. Illustrations. Completed work. Catalog. 9½ x 12½ in. 98 pp.

HARDWARE

Columbian Hardware Co., The, Cleveland, Ohio.
Making It Easier to Buy Columbian Sash Pulleys. Folder. 3¼ x 8¼ in. 14 pp.

Alphabetical Index of Advertisers on Page 4

"DOING OUR BIT"

Better than Promised

3800 Raymond Concrete Piles in 30 days from Date of Contract

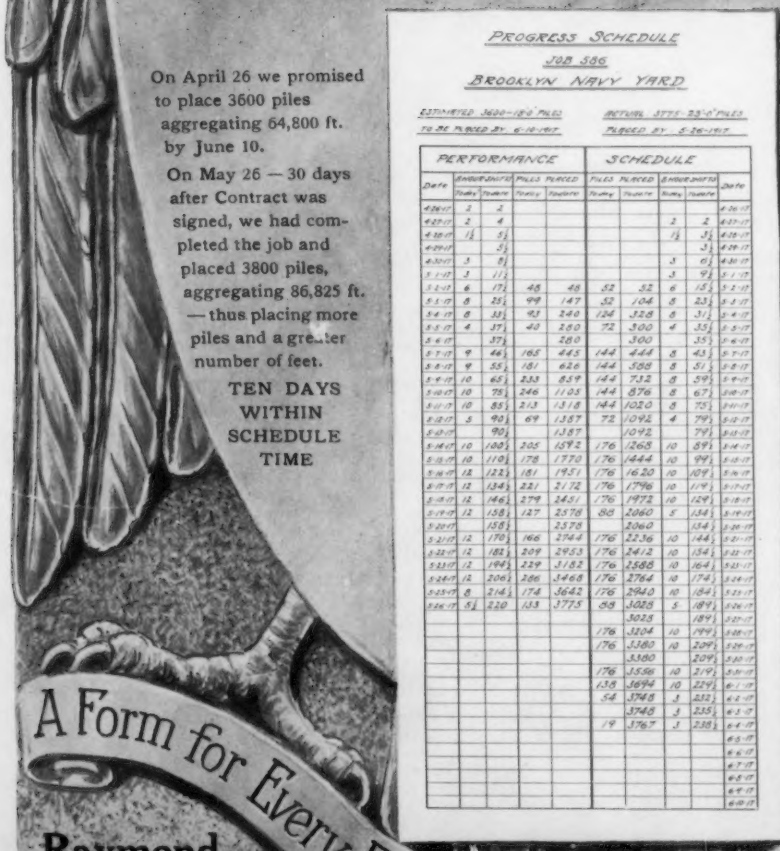
for the

United States Government

On April 26 we promised to place 3600 piles aggregating 64,800 ft. by June 10.

On May 26 — 30 days after Contract was signed, we had completed the job and placed 3800 piles, aggregating 86,825 ft. — thus placing more piles and a greater number of feet.

TEN DAYS WITHIN SCHEDULE TIME


PROGRESS SCHEDULE
JOB 586
BROOKLYN NAVY YARD

ESTIMATED 3600-18'0 PILES TO BE PLACED BY 6-10-1917 — ACTUAL 3775-23'0 PILES PLACED BY 5-26-1917

PERFORMANCE					SCHEDULE				
Date	8 HOUR SHIFTS		PILES PLACED		PILES PLACED		8 HOUR SHIFTS		Date
	Today	Total	Today	Total	Today	Total	Today	Total	
4-26-17	2	2							4-26-17
4-27-17	2	4					2	2	4-27-17
4-28-17	1½	5½					1½	3½	4-28-17
4-29-17		5½						3½	4-29-17
4-30-17	3	8½					3	6½	4-30-17
5-1-17	3	11½					3	9½	5-1-17
5-2-17	6	17½	48	48	52	52	6	15½	5-2-17
5-3-17	8	25½	99	147	52	104	8	23½	5-3-17
5-4-17	8	33½	93	240	124	328	8	31½	5-4-17
5-5-17	4	37½	40	280	72	300	4	35½	5-5-17
5-6-17		37½		280		300		35½	5-6-17
5-7-17	9	46½	165	445	144	444	8	43½	5-7-17
5-8-17	9	55½	181	626	144	588	8	51½	5-8-17
5-9-17	10	65½	233	859	144	732	8	59½	5-9-17
5-10-17	10	75½	246	1105	144	876	8	67½	5-10-17
5-11-17	10	85½	213	1318	144	1020	8	75½	5-11-17
5-12-17	5	90½	69	1387	72	1092	4	79½	5-12-17
5-13-17		90½		1387		1092		79½	5-13-17
5-14-17	10	100½	205	1592	176	1268	10	89½	5-14-17
5-15-17	10	110½	178	1770	176	1444	10	99½	5-15-17
5-16-17	12	122½	181	1951	176	1620	10	109½	5-16-17
5-17-17	12	134½	221	2172	176	1796	10	119½	5-17-17
5-18-17	12	146½	279	2451	176	1972	10	129½	5-18-17
5-19-17	12	158½	127	2578	88	2060	5	134½	5-19-17
5-20-17		158½		2578		2060		134½	5-20-17
5-21-17	12	170½	166	2744	176	2236	10	144½	5-21-17
5-22-17	12	182½	209	2953	176	2412	10	154½	5-22-17
5-23-17	12	194½	229	3182	176	2588	10	164½	5-23-17
5-24-17	12	206½	286	3468	176	2764	10	174½	5-24-17
5-25-17	8	214½	174	3642	176	2940	10	184½	5-25-17
5-26-17	5½	220	133	3775	88	3028	5	189½	5-26-17
						3028		189½	5-27-17
					176	3204	10	199½	5-28-17
					176	3380	10	209½	5-29-17
						3380		209½	5-30-17
					176	3556	10	219½	5-31-17
					138	3694	10	229½	6-1-17
					54	3748	3	232½	6-2-17
						3748	3	235½	6-3-17
					19	3767	3	238½	6-4-17
									6-5-17
									6-6-17
									6-7-17
									6-8-17
									6-9-17
									6-10-17

And We Thank

The Turner Construction Co.
Vulcanite Cement Co.
Goodwin Sand & Gravel Co.
N. Y. Central Railroad Co.
Youngstown Sheet & Tube Co.
John D. Kane Co.

for their active co-operation — and our organization

for their loyal Services

A Form for Every Pile

A Pile for Every Purpose

Raymond Concrete Pile Company

New York
140 Cedar Street
Chicago, 111 West Monroe St.
Montreal, Canada
Raymond Concrete Pile Co., Ltd.
822 New Birks Bldg.
Branch Offices in all Principal Cities

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 28*

HARDWARE—Continued

Corbin, P. & F., New Britain, Conn.
Colonial Hardware. Booklet. 5 x 7 in. 32 pp.
Corbin Door Checks. Catalog. 5 x 7 in. 40 pp.
Corbin Door Knockers. Booklet. 5 x 7 in. 24 pp.
General Catalog. 10½ x 13 in. 1200 pp.

Imperial Brass Mfg. Co., 1208 West Harrison Street, Chicago.
Hardware Catalog No. 105. 6 x 9 in. 36 pp.

Reliance Ball Bearing Door Hanger Co., 70 East 45th Street, Grand Central Terminal, New York.
Door Hangers, etc. Catalog. 8 x 9½ in. 32 pp.

Russell & Erwin Mfg. Co., New Britain, Conn.
General Catalog. 9 x 12 in. 1250 pp.
Russwin Period Design Booklet. 6 x 8 in. 72 pp.
Russwin Fire Exit Bolt Catalog. 6 x 9 in. 46 pp.
Russwin Monograph (28 subjects). 3½ x 6 in. 6 pp.

Stanley Works, The, New Britain, Conn.
Wrought Hardware. Catalog. Describing wrought steel hinges, butts and door bolts. 6½ x 10 in. 260 pp.
Stanley's Wrought Steel Garage Door Hardware. Booklet. 3½ x 6¼ in. 8 pp.
Properly Hung Doors. Booklet. 5 x 7⅛ in. 16 pp.
"Stanley" Sherardizing. Descriptive booklet. 3½ x 6¼ in. 4 pp.

Vonnegut Hardware Company, Indianapolis.
Von Duprin Self-Releasing Fire Exit Device. Catalog 12F.

HEATING EQUIPMENT

American Blower Co., Detroit, Mich.
"A B C" Heaters. Bulletin. 8½ x 11 in. 24 pp.
Vento Cast-Iron Hot-Blast Heater. Bulletin. 8½ x 11 in. 44 pp.

American Radiator Co., 816 S. Michigan Avenue, Chicago.
The Ideal Fitter. Handbook with specification data. 6⅝ x 3¼ in. 336 pp.

Boynton Furnace Co., The, 106 West 37th Street, New York.
Square Pot Heaters. Catalog. 7 x 9¼ in. 60 pp.

Crane Co., 836 South Michigan Avenue, Chicago.
Steam Goods. Complete pocket catalog. 4½ x 6 in. 620 pp.

Dunham Company, C. A., Marshalltown, Ia.
Dunham Specialties. Loose leaf bulletin No. 11, with engravings, data, and specifications. 6 x 9½ in. 52 pp.

Fulton Company, The, 141 Broadway, New York.
Catalog D. 7 x 10¼ in. 22 pp.

Gorton & Lidgerwood Co., 96 Liberty Street, New York.
Modern House Heating. Catalog No. 88. 4¼ x 7 in. 32 pp.

Jenkins Bros., 80 White Street, New York.
Catalog and Price List. 4 x 6¾ in. 256 pp.

Kelsey Heating Co., The, 238 James Street, Syracuse, N. Y.
Architects' Portfolio. 12 plates showing plans, heating, specifications, and layouts. 8½ x 11 in.
Kelsey System of Heating and Ventilating. Booklet. 36 pp.
Kelsey Warm Air Generators. Booklet. 32 pp.

Lord & Burnham Co., 42d Street Building, New York.
Burnham Boilers. Catalog No. 56. 4 x 10 in. 19 pp.

National Tube Company, Frick Building, Pittsburgh, Pa.
Catalog J. Descriptive of fittings and valves. 5½ x 7¾ in. 488 pp.
The Whole Kewanee Family. Booklet. Illustrations. 5 x 8 in. 72 pp.

Sturtevant Co., B. F., Dept. B, Hyde Park, Boston, Mass.
Heating and Ventilation. Treatise. 6½ x 9 in. 325 pp.

United States Radiator Corporation, Detroit.
A Modern "House Warming." Booklet. 6 x 9 in. 30 pp.
The "Complete Line." Technical data. Catalog. 4¼ x 7¼ in. 270 pp.

HOISTS

Gillis & Geoghegan, 544 West Broadway, New York.
The G. & G. Telescopic Hoist (all models). Booklet A. 8½ x 11 in. 16 pp.

INSULATION

Armstrong Cork & Insulation Co., 132 24th Street, Pittsburgh.
Nonpareil Corkboard Insulation. Scientific treatise. 6 x 9 in. 130 pp.
Nonpareil High Pressure Covering. Scientific treatise. 6 x 9 in. 84 pp.

Cabot, Inc., Samuel, 141 Milk Street, Boston.
Cabot's Quilt. Booklet. 6 x 8½ in. 32 pp.

Johns-Manville Co., H. W., Madison Avenue, New York.
J-M Keystone Hair Insulator. Booklet. 6 x 9 in. 16 pp.
How to Reduce Coal Bills 25 Per Cent. (J-M Asbestocel Pipe Covering.) Booklet. 3½ x 6 in. 8 pp.

JOISTS AND STUDS, PRESSED STEEL

Berger Manufacturing Co., Canton, Ohio.
Metal Lumber. Series of technical bulletins 12F especially prepared for architects. 8½ x 11 in. 32 pp.
Riblex, Bulletin No. 14. 8½ x 11 in. 4 pp.

JOISTS AND STUDS, PRESSED STEEL—Continued

Trussed Concrete Steel Co., Dept. S-64, Youngstown, Ohio.
Kahn Pressed Steel Construction. Catalog. Complete details and specifications. 8½ x 11 in. 32 pp.

LATH, METAL

Berger Manufacturing Co., Canton, Ohio.
Berger's Expanded Metal Lath. Booklet. 3⅝ x 6 in. 44 pp. Supplement. 24 pp.

General Fireproofing Co., The, Youngstown, Ohio.
Herringbone Rigid Metal Lath. A complete catalog on Herringbone Metal Lath. 6 x 9 in. 32 pp.

North Western Expanded Metal Co., Old Colony Building, Chicago, Ill.
Designing Data. Scientific treatise on reinforced concrete. 4 x 6½ in. 88 pp.
Kno-Burn Expanded Metal Lath. Treatise on metal lath, with details and specifications. 6 x 9 in. 52 pp.
"Chanelath" Handbook. Treatise on ribbed metal lath details and specifications of its application to reinforced concrete construction and for plastering. 6 x 9 in. 64 pp.
Stucco Specifications. Reprint of the standard specifications adopted by the American Concrete Institute.

Trussed Concrete Steel Co., Dept. S-64, Youngstown, Ohio.
Hy-Rib Handbook. Specifications. 5½ x 7¾ in. 142 pp.

Wright Wire Co., Worcester, Mass.
General Catalog. Description and full particulars of wire lath, wire fencing, ornamental iron work, elevator cabs, railings, partitions, and grille work. 6 x 9 in. 224 pp.
Wire Lath. Booklet L. Shows where Wright wire lath has been used. 3½ x 6½ in. 16 pp.

LIGHTING EQUIPMENT

Ivanhoe-Regent Works of General Electric Co., 1133 East 152d Street, Cleveland.
Lighting Handbook. Semi-technical on general lighting practice. 4 x 7 in. 94 pp.
Semi-Indirect Lighting Bowls. Catalog No. 108. 8 x 10½ in. 48 pp.
Holophane Reflectors and Fittings. Catalog No. 80. 4 x 7 in. 50 pp.
Ivanhoe Reflectors and Fittings. Catalog No. 303. 4 x 7 in. 50 pp.

Luminous Unit Co., St. Louis.
Brascolite—The Modern Semi-Indirect Lighting System. Catalog No. 5. 8¼ x 10¾ in. 24 pp.
Brascolite Data. Scientific data sheets. Portfolio. 9 x 11½ in. Blue prints.
Aglites. Folder catalog. All-glass lighting fixtures. 5¼ x 8 in. 8 pp.

McFaddin & Co., H. G., 42 Warren Street, New York.
Emeralite. Booklet. Colored plates. 3½ x 6¼ in. 32 pp.
Mefcolite Semi-Indirect Electric Units. 3½ x 6¼ in. 8 pp.

National X-Ray Reflector Co., 243 West Jackson Boulevard, Chicago.
Engineering Data Book. Technical handbook. 6 x 9 in. 125 pp.
Illumination from Concealed Sources—How to Plan and Specify Indirect Lighting. Scientific treatise. 12 x 15 in. 52 pp. 36 detail drawings.

St. Louis Brass Mfg. Co., St. Louis.
"Concealite" Catalog A. Lighting fixtures for auditoriums, banks, show windows, etc., from concealed or semi-concealed sources. 7⅞ x 10½ in. 20 pp.

METAL TRIM—See Doors, Windows, and Trim, Metal.

METAL WORK, ORNAMENTAL

Gorham Co. Architectural Bronze, The, Fifth Avenue and 36th Street, New York.
Architectural Bronze Work. Portfolio. 9¼ x 12¼ in. Plates.
Architectural Mouldings and Rosettes. Catalog. 9¼ x 12½ in. 16 plates.

Polachek Bronze and Iron Co., John, 480-494 Hancock Street, Long Island City, N. Y.
Distinctive Metal Work. Booklet. 8½ x 11 in. 6 pp.

Smyser-Royer Company, York, Pa.
Portfolio illustrating standards and other lighting fixtures. 4½ x 10¾ in. 175 pp. thus far.

Tuttle & Bailey Mfg. Co., 52 Vanderbilt Avenue, New York.
Special Designs of Grilles and Screens in Bronze, Brass, Iron, and Steel. Catalog No. 66A. 6½ x 10 in. 40 pp.

Winslow Bros. Company, 4600-4700 West Harrison Street, Chicago.
Ornamental Iron and Bronze. Illustrations of completed work. 8½ x 11 in. 300 pp.

OFFICE SUPPLIES, ARCHITECTS'

Dixon Crucible Co., Joseph, Dept. 224-J, Jersey City, N. J.
"Eldorado"—the Master Drawing Pencil. Booklet.

Alphabetical Index of Advertisers on Page 4



IN these busy days you cannot afford to wait for building materials. In our main warehouse at Youngstown we have large stocks of sash units (shown below) to meet practically all building requirements. All units are furnished in two glass sizes — 12″ x 18″ and 14″ x 20″. The sash are the same high-quality United Steel Sash which have demonstrated their superiority in so many tests and investigations.

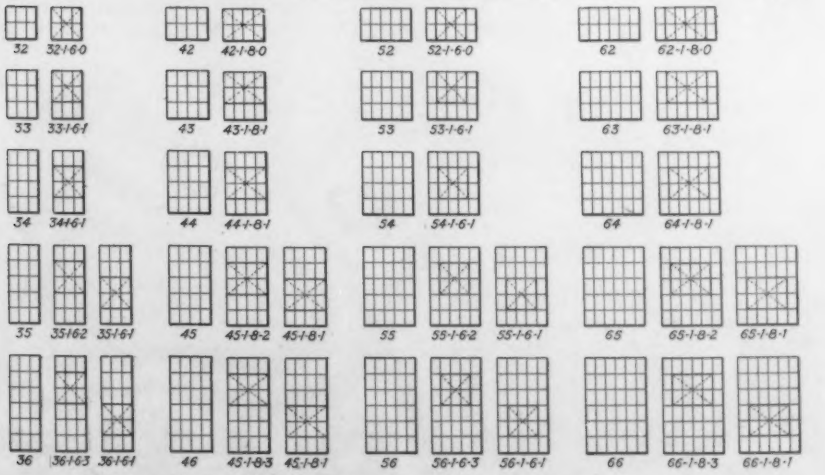
We also furnish Semi-Stock Sash in which the ventilators are carried in stock and frames made to order, as well as To-Order Sash to meet any special requirements. The complete line of United Steel Sash includes everything in pivoted and sliding sash, continuous sash, partitions, doors, etc., all distinctly superior in strength, weathering, workmanship, hardware, finish and service.

For quick deliveries, specify stock sizes of United Steel Sash, thus saving time and money. Write for Stock Sash Pamphlet or complete Sash Handbook.

KAHN Building Products — TRUSSED CONCRETE STEEL CO.

Steel Sash Dept. YOUNGSTOWN, OHIO

Representatives in Principal Cities



Stock sizes of United Steel Sash. Furnished in two glass sizes, 12″ x 18″ and 14″ x 20″

Table of Widths of Window Openings

Width of Window Openings	Size of Glass	Total Lights Wide	No. Sash Units
3′ 3″	12 x 18	3	1
3′ 9″	14 x 20	3	1
4′ 3¼″	12 x 18	4	1
4′ 11½″	14 x 20	4	1
5′ 4″	12 x 18	5	1
6′ 2″	14 x 20	5	1
6′ 4¾″	12 x 18	6	1
6′ 8″ to 6′ 9″	12 x 18	6	2
7′ 4½″	14 x 20	6	1
7′ 8″ to 7′ 9″	14 x 20	6	2
8′ 9″ to 8′ 10″	12 x 18	8	2
10′ 0¼″ to 10′ 2¾″	12 x 18	9	3
10′ 1″ to 10′ 2″	14 x 20	8	2
10′ 10″ to 10′ 11″	12 x 18	10	2
11′ 1″ to 11′ 3″	12 x 18	10	3
11′ 6¼″ to 11′ 8½″	14 x 20	9	3
12′ 1¼″ to 12′ 3½″	12 x 18	11	3
12′ 6″ to 12′ 7″	14 x 20	10	2
12′ 9″ to 12′ 11″	14 x 20	10	3
12′ 11″ to 13′ 0″	12 x 18	12	2
13′ 2″ to 13′ 4″	12 x 18	12	3
13′ 5¼″ to 13′ 8¾″	12 x 18	12	4
13′ 11½″ to 14′ 1½″	14 x 20	11	3
14′ 2¾″ to 14′ 4½″	12 x 18	13	3
14′ 11″ to 15′ 0″	14 x 20	12	2
15′ 2″ to 15′ 4″	14 x 20	12	3
15′ 3″ to 15′ 5″	12 x 18	14	3
15′ 5¼″ to 15′ 8¾″	14 x 20	12	4
15′ 6¾″ to 15′ 9½″	12 x 18	14	4
16′ 3½″ to 16′ 5¾″	12 x 18	15	3
16′ 4½″ to 16′ 6¾″	14 x 20	13	3
17′ 4″ to 17′ 6″	12 x 18	16	3
17′ 7″ to 17′ 9″	14 x 20	14	3
17′ 7¾″ to 17′ 10½″	12 x 18	16	4
17′ 10½″ to 18′ 1¾″	14 x 20	14	4
18′ 4¾″ to 18′ 6¾″	12 x 18	17	3
18′ 9½″ to 18′ 11½″	14 x 20	15	3
19′ 5″ to 19′ 7″	12 x 18	18	3
19′ 8½″ to 19′ 11½″	12 x 18	18	4
20′ 0″ to 20′ 2″	14 x 20	16	3
20′ 3½″ to 20′ 6½″	14 x 20	16	4
21′ 2¾″ to 21′ 4½″	14 x 20	17	3
21′ 9½″ to 22′ 0¾″	12 x 18	20	4
22′ 5″ to 22′ 7″	14 x 20	18	3
22′ 8½″ to 22′ 11½″	14 x 20	18	4
23′ 10½″ to 24′ 1½″	12 x 18	22	4
25′ 1¼″ to 25′ 4¼″	14 x 20	20	4
25′ 11½″ to 26′ 2¾″	12 x 18	24	4
27′ 6¾″ to 27′ 9½″	14 x 20	22	4
29′ 11½″ to 30′ 2¾″	14 x 20	24	4

Table of Heights of Window Openings

Height of Window Openings	Size of Glass	Total Lights High	No. Sash Units
3′ 2″	12 x 18	2	1
3′ 6″	14 x 20	2	1
4′ 8¾″	12 x 18	3	1
5′ 2¾″	14 x 20	3	1
6′ 3″	12 x 18	4	1
6′ 11″	14 x 20	4	1
7′ 9¼″	12 x 18	5	1
8′ 7¾″	14 x 20	5	1
9′ 4″	12 x 18	6	1
10′ 4″	14 x 20	6	1

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 30*

ORNAMENTS, PLASTIC

Jacobson & Company, 241 East 44th Street, New York.
Architectural and Decorative Ornaments. Catalog. 9¼ x 12¼ in. 192 pp.

PAINTS, VARNISHES, AND WOOD FINISHES

Arco Company, The, 235 Wise Building, Cleveland, Ohio.
Arco Specifications. Loose leaf specifications for full Arco line. 22 specifications. 8½ x 11 in.
Arco Bonding Coat, Arco Foundation Coat, and Arco Stone Backing. Technical treatise and specifications. 8 x 11 in. 16 pp.
The Arco Company. An organization. Booklet showing the men, the methods, the policy, and the plant behind the Arco products. 8 x 11 in. 16 pp.

Berry Bros., Detroit, Mich.
Natural Woods and How to Finish Them. Complete varnish specifications. 4¼ x 6½ in. 94 pp.
Luxeberry Cement Coating. Color card. 3⅛ x 8⅞ in. 3 pp.

Boston Varnish Co., Everett Station, Boston.
Kyanize Enamel. Specifications. Booklet. 5 x 7 in. 20 pp.
Kyanize White Enamel. Directions. Circular. 3½ x 6 in. 8 pp.
Price List of Varnishes and Enamels. 3½ x 6 in. 24 pp.

Dixon Crucible Co., Joseph, Dept. 224-J, Jersey City, N. J.
Philosophy of Protective Paint. 3¼ x 6¼ in. 24 pp.

Keystone Varnish Co., 1123 Keystona Building, Brooklyn.
Zinolin—The Arnoldized Zinc Paint for Outside Use. Booklet. 6 x 9 in. 4 pp.

Lowe Bros. Co., The, 101 Park Ave., New York and Dayton.
Architects' Mellotone Handbook. 3 x 8 in. 27 pp. Color plates.
High Standard Paint and Varnish Specifications. Handbook. 4½ x 7 in. 70 pp.
Paint and Painting. Directions and data. 5 x 9 in. 30 pp.
Varnish and Varnishing. Treatise. 5 x 9 in. 44 pp.

Murphy Varnish Co., Newark, N. J.
The House That Found Itself. Booklet. 6¼ x 9¼ in. 28 pp.
Harmony in Interior Decoration. Booklet. 5¾ x 8¼ in. 56 pp.
Dealer's Descriptive List. Booklet. 4½ x 6¼ in. 28 pp.
Beautiful Boats and How to Care for Them. Booklet. 5¼ x 8¾ in. 50 pp.

O'Brien Varnish Company, The, 34 Washington Street, South Bend, Ind.
Specification Data. Information concerning O'Brien line of varnishes and interior finishes. 8½ x 11 in.

Smith & Co., Edward, P. O. Box 1780, New York.
Architects' Handbook. Specifications. 5 x 7⅛ in. 24 pp.

Toch Brothers, Dept. 97, 320 Fifth Avenue, New York.
Specifications for Damp-proofing, Waterproofing, Enameling, and Technical Painting. 8¼ x 11½ in. 48 pp.
Toch Brothers Preservative Paints and Compounds. Booklet. 5½ x 8¼ in. 36 pp.

Wadsworth, Howland Co., Inc., 139 Federal Street, Boston.
Bay State Finishes, Stains, and Varnishes. Catalog. Color cards.

PARTITIONS, FOLDING AND ROLLING

Folding Partition Co., Inc., 200 Broadway, New York, N. Y.
Sectionfold Partitions. Catalog with detail sheet. 20 x 27 in.

PILES

MacArthur Concrete Pile and Foundation Co., 120 Broadway, New York.
The Pedestal Pile. Catalog and handbook "B." Engineering data. 6 x 9 in. 64 pp.

Raymond Concrete Pile Co., 140 Cedar Street, New York.
Raymond Concrete Piles. Catalog. 8½ x 11¼ in. 56 pp.

PIPE

Byers Company, A. M., 235 Water Street, Pittsburgh.
Bulletin No. 26. Tables and specifications. Bulletin (2d Edition, Enlarged and Revised). 8½ x 11 in. 24 pp.
Bulletin No. 27. The experience of practical men. 8½ x 11 in. 40 pp.
Selection of Pipe for Modern Buildings. Booklet of special interest to architects. 4 x 6 in.
A Micro Study. Circular showing how slag in wrought iron resists corrosion. 5 x 11 in.

Central Foundry Company, 90 West Street, New York.
Soil Pipe and Fittings. Catalog. 4 x 7½ in. 88 pp.
The Lynn Drain Trap. A leaflet containing description.
Combination Vent, Revent, and Drainage Fittings. Catalog. 4¼ x 6¾ in. 183 pp.

National Tube Company, Frick Building, Pittsburgh, Pa.
Shelby Mechanical Tubing. Booklet. 3½ x 6 in. 35 pp.
Boiler Tubes List No. 6, 1916. Booklet. 4 x 6½ in. 16 pp.
Pipe List No. 5, 1913. Booklet. 4 x 6½ in. 20 pp.
National Bulletins, Nos. 1 to 27, inclusive. 8½ x 11 in.
National Pipe Standards. Booklet. Appendix to 1913 edition. Tables and useful information pertaining to tubular goods. 4 x 6½ in. 400 pp.

PLASTER

Hydrated Lime Bureau, 1506 Arrott Bldg., Pittsburgh.
Standard Specifications for Hydrated Lime Plastering. Pamphlet E. 6¼ x 9¼ in. 20 pp.
Better Plastering and Better Acoustics. Bound booklet. 6¼ x 9¼ in. 40 pp.

Kelley Island Lime & Transport Co., Cleveland, Ohio.
Specifications for Hydrated Lime Plastering. Booklet. 6 x 9 in. 20 pp.
Hydrated Lime Plaster. Booklet. 6¼ x 9¼ in. 12 pp.
Tiger Tales. Booklet. 4 x 8 in. 12 pp.
The Perfect Finishing Lime. Booklet. 4½ x 7¼ in. 34 pp.

PLUMBING EQUIPMENT

Crane Co., 836 South Michigan Avenue, Chicago.
Catalog. 9 x 12 in. 834 pp.

Imperial Brass Mfg. Co., 1208 West Harrison Street, Chicago.
Shower Mixer. Booklet. 3 x 8 in. 16 pp.

Kohler Co., Kohler, Wis.
Kohler Catalog. Cloth bound. 9½ x 11¾ in. 164 pp.

Standard Sanitary Mfg. Co., Dept. 4, Pittsburgh, Pa.
"Standard" Catalog. General catalog of "Standard" line. 9 x 12 in. 676 pp.
"Standard" Plumbing Fixtures for the Home. Catalog.
Factory Sanitation. Catalog and scientific treatise. 9 x 12 in. 36 pp.

Trenton Potteries Co., Trenton, N. J.
Bathrooms of Character. Booklet. 4 x 7¼ in. 48 pp.
Sanitary Pottery. Monthly house organ. 6 x 9 in. 16 pp. Color plates.

POTTERY, GARDEN

Atlantic Terra Cotta Company, 1170 Broadway, New York.
Garden Pottery. Catalog. 9 x 12 in. 12 pp.

PUMPS

Goulds Manufacturing Co., Seneca Falls, N. Y.
All Types of Centrifugal and Reciprocating Power Pumps. Bulletins. 20 sections. 7¾ x 10 in.
Handy Data on Power Pumping. Bulletin 118. 7¾ x 10 in. 24 pp.

ROOFING

American Sheet & Tin Plate Co., Frick Building, Pittsburgh.
Copper—Its Effect Upon Steel for Roofing Tin. Scientific treatise. New edition. 8½ x 11 in. 24 pp.
Pocket Reference Book. 2½ x 4¼ in. 168 pp.

Barrett Company, The (formerly The Barrett Manufacturing Company), 17 Battery Place, New York City.
Barrett's Specification Roofs—20-Year Guaranty Bond. Loose-leaf specifications with details. 8½ x 14 in.
Foundation Waterproofing. Loose-leaf specifications. 8½ x 14 in.
Tylike Shingles with Red or Green Crushed Slate Surface. For residences, etc. Descriptive booklet. 6 x 8 in.
Velvex Creosote Shingle Stains. Descriptive folder showing colors on wood. 3½ x 6½ in.

Creo-Dipt Co., 1025 Oliver Street, North Tonawanda, N. Y.
Book of Homes. Houses on which "Creo-dipt" shingles have been used. Booklet. 8 x 10 in. 32 pp.

General Slate Company, 51 Federal Street, Boston.
General Slate Company—Roofing Slate. Booklet. 6 x 9 in. 16 pp.

Johns-Manville Co., H. W., Madison Avenue, New York.
J-M Corrugated Asbestos Roofing. Catalog. 6 x 9 in. 32 pp.
J-M Transite Asbestos Shingles. Catalog. 6 x 9 in. 32 pp.

Ludowici-Celadon Company, 104 South Michigan Avenue, Chicago.
Roofing Tile. A detailed reference for architects. 9¾ x 13½ in. 106 pp.
Roofing Tile Catalog. 3¾ x 9 in. 10 pp.
The Roof Beautiful. Booklet. 6¾ x 9¼ in. 40 pp. Color plates.
Why Tile Is Best. Booklet. 3¼ x 6¼ in. 8 pp.

Taylor Co., N. & G., 300 Chestnut Street, Philadelphia.
A Guide to Good Roofs. Booklet. 3¾ x 5⅞ in. 24 pp.
Selling Arguments for Tin Roofing. Booklet. 6 x 9¼ in. 80 pp.
"Service Sheets." Working Drawings. Construction and tables of covering capacity of tin. 16½ x 21½ in.
Standard Specifications for Tin Roofing Work. 7½ x 9 in.

STONE

Indiana Limestone Quarrymen's Association, P. O. Box 505, Bedford, Ind.
Indiana Limestone Booklet. 6 x 8¾ in. 40 pp.

STORE FRONTS

Detroit Show Case Co., 467 Fort Street West, Detroit, Mich.
Metal Store Front Construction. Handbook. 6 x 10 in. 32 pp. With full size blue print details. 24 x 36 in.

Alphabetical Index of Advertisers on Page 4

The Base of The Pedestal Pile

Here is how the base of the Pedestal Pile looks under ground (reproduced from an actual photograph). If you built it in the open, you couldn't secure a better shape than this—solid concrete 3 feet through, surmounted by a monolithic concrete column 16 inches in diameter.

This is why Pedestal Piles carry such enormous loads without settlement. That's why more than a million feet of Pedestal Piles have been selected by engineers in all parts of the world for all types of foundations.

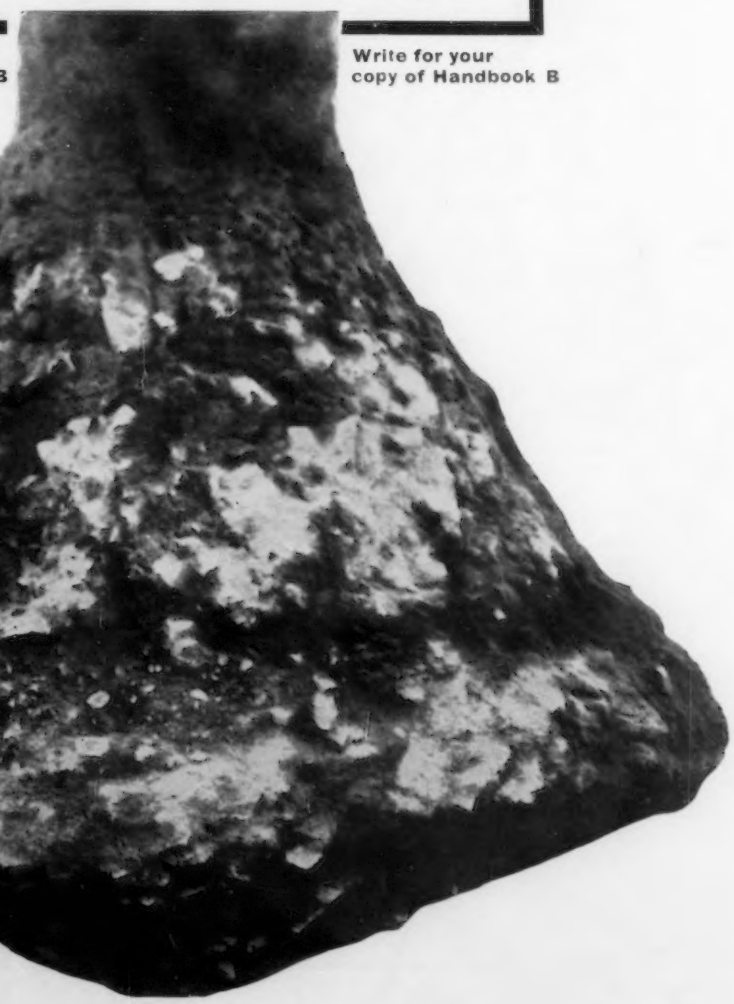
Handbook B shows how they are made and why they are better than other types of piles.

64 pages of facts and illustrations. **Write for a copy.**

MacArthur
Concrete Pile and Foundation Co.
120 Broadway, New York

Chicago Detroit New Orleans Boston San Francisco Philadelphia Atlanta Pittsburgh Montreal

Write for your copy of Handbook B



Write for your copy of Handbook B

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS— *Continued from page 32*

STORE FRONTS—Continued

Kawneer Manufacturing Co., Niles, Mich.
Architects' Portfolio of Details. 17 full size construction plates, loose leaf. 34 x 44 in. Also 17 half size construction plates, bound. 8½ x 11 in.

Zouri Drawn Metals Co., 1817-1847 East End Avenue, Chicago Heights, Ill.
Zouri Safety Key-Set Store Front Construction. Detail sheet showing sections of construction. 9 x 11 in. 4 pp.

STUCCO BOARD

Bishopric Manufacturing Co., The, 910 Este Avenue, Cincinnati, Ohio.
The Bishopric Mastic Products. Booklet. 6 x 9½ in. 24 pp. Color plates.
Built on the Wisdom of Ages. Booklet showing methods of using Bishopric Stucco Board. 8½ x 11 in. 48 pp.

TELEPHONE SYSTEMS, INTERIOR

New York Telephone Co., 15 Dey Street, New York.
Intercommunicating Residence Telephone Service. Booklet. 5 x 7 in. 16 pp.

TERRA COTTA, ARCHITECTURAL

American Terra Cotta & Ceramic Co., 2010 Peoples' Gas Building, Chicago.
Specifications for Architectural Terra Cotta and Details of Construction. 14 plates.

Atlantic Terra Cotta Co., 1170 Broadway, New York.
Atlantic Terra Cotta. Monthly publication. 9 x 12 in. 12 pp.

Conkling-Armstrong Terra Cotta Co., Philadelphia.
Ornament and Details of Construction. Catalog. 9½ x 13 in.

Midland Terra Cotta Co., 1515 Lumber Exchange Building, Chicago.
Stock Terra Cotta. Portfolio. 10 x 15 in. 60 plates.

New Jersey Terra Cotta Co., Singer Building, New York.
The Victoria Building. Booklet. 8½ x 11 in. 10 pp.

New York Architectural Terra-Cotta Co., 401 Vernon Avenue, Long Island City, N. Y.
Architectural Terra Cotta. Booklet. 8 x 8¼ in. 36 pp.

South Amboy Terra Cotta Co., 150 Nassau Street, New York.
Plates of Ornamental Detail and Construction. Portfolio.

TILE, HOLLOW

National Fire Proofing Co., 590 Federal Street, Pittsburgh.
Builders' Handbook. Details of construction. 8½ x 11 in. 34 pp. Blue prints.
Fireproof Houses of Natco Hollow Tile. Catalog. 8½ x 11 in. 30 pp.
Long Span Fireproof Floor Construction. Details, tables, tests. Handbook. 8½ x 11 in. 60 pp. Color plates.
Natco on the Farm. Catalog. 5½ x 7½ in. 50 pp.

TILE, STEEL

General Fireproofing Co., The, Youngstown, Ohio.
Steel-Tile Handbook. Tables, formulas, specifications, etc., for tile floors and concrete work. 6 x 9 in. 32 pp.

Trussed Concrete Steel Co., Dept. S-64, Youngstown, Ohio.
Floretyle Construction. Booklet containing table and full information for specifying. 8½ x 11 in. 16 pp.

VENTILATION

American Blower Co., Detroit, Mich.
American Sirocco Fans and Blowers. Bulletin. 8½ x 11 in. 52 pp.

American Radiator Co., 816 So. Michigan Avenue, Chicago.
"A B C" Steel Plate Fans. Bulletin. 8½ x 11 in. 28 pp.
Ventilation by Vento Heaters. Booklet. 8 x 10¼ in. 24 pp.

Clarage Fan Co., Kalamazoo, Mich.
Catalog No. 5. 6 x 9 in. 26 pp.

Globe Ventilator Co., Dept. P, Troy, N. Y.
Booklet. 4 x 9 in. 36 pp.

Ohio Blower Co., The, 5119 Perkins Avenue, Cleveland.
Gospel of Fresh Air. Booklet. 4 x 9 in. 24 pp.

Sturtevant Co., B. F., Hyde Park, Boston.
Sturtevant Heaters. Catalog, containing data, curves, tables, and complete layouts for the use of architects in specifying heating and ventilating systems. 8½ x 11 in. 132 pp.

WALL BOARD

Carey Co., The Philip, Lockland, Cincinnati.
Carey "Ceil-board" for Walls and Ceilings. Specifications. 8 x 11 in. 2 pp.

WALL COVERINGS

Standard Oil Cloth Company, Inc., The, Dept. I, 320 Broadway, New York.
Sanitas Modern Wall Covering. Booklet. 5 x 7 in. 28 pp. Color plates.
Hints to Decorators. Booklet. 5 x 7 in. 12 pp. Colored inserts.
What They Say About Sanitas. Booklet. 5 x 7 in. 27 pp.
Selling Helps. Booklet. 5 x 7 in. 24 pp.

WATERPROOFING

Anti-Hydro Waterproofing Co., 9 Orchard Street, Newark, N. J. (Singer Building, N. Y. C.)
Concrete Hardener Waterproofing. Booklet. 6½ x 8¼ in. 8 pp.

General Fireproofing Co., The, Youngstown, Ohio.
Waterproofing Handbook. 6 x 9 in. 88 pp.

Sandusky Cement Co., The, Dept. S, Engineers' Building, Cleveland, Ohio.
Medusa Waterproofing. Booklet. 7 x 9 in. 36 pp.

Sonneborn Sons, Inc., L., Dept. 4, 264 Pearl St., New York.
Concrete and Lapidolith. Treatise on concrete construction and the use of Lapidolith with it. 5¼ x 8¼ in. 20 pp.

Trus-Con Laboratories, 1246 Trus-Con Building, Detroit, Mich.
Architects' Handbook. 8½ x 11 in. 36 pp.
Structural Waterproofing. 8½ x 11 in. 52 pp.
Agatex Book. 5½ x 8 in. 18 pp.
Descriptive Price List. 3½ x 6¼ in. 24 pp.

Wadsworth, Howland Co., Inc., 139 Federal Street, Boston.
Bay State Brick and Cement Coating. Booklet No. 10. Color plates.

WATER SYSTEMS

Armstrong Cork & Insulation Co., 132 24th St., Pittsburgh.
Drinking Water Systems. Treatise. 6 x 9 in. 48 pp.

WINDMILLS

Corcoran, Inc., A. J., 763 Jersey Avenue, Jersey City, N. J.
Windmills. Booklet.

WINDOWS, CASEMENT

Crittall Casement Window Co., Detroit, Mich.
Universal Casements. Catalog No. 15, showing solid steel casement windows. Details. 9¼ x 12 in. 64 pp.

Hope & Sons, Henry, 103 Park Avenue, New York.
Casement Windows. Details and sections. Catalog. 10 x 15 in. 187 pp.

International Casement Co., Inc., Jamestown, N. Y.
Casement Windows and Leaded Glass. Catalog. 10 x 14 in. 56 pp. Plates showing 16th century Tudor residences.

WIRE FENCES

Wright Wire Company, Worcester, Mass.
Excelsior Rust Proof Fencing. Illustrated and descriptive booklet. 3½ x 6 in. 16 pp.

WIRE, INSULATED

Simplex Wire & Cable Co., 201 Devonshire Street, Boston.
The Simplex Manual. Catalog. 4¼ x 6¼ in. 92 pp.

WOOD

Gum Lumber Manufacturers' Association, 1304 Bank of Commerce Building, Memphis, Tenn.
Red Gum Facts. Catalog. 5½ x 8½ in. 20 pp.
Technical Information about Red Gum. Catalog. 5¼ x 9 in. 20 pp.

North Carolina Pine Association, 83 Bank of Commerce Building, Norfolk, Va.
Architects' Reference Book. Booklet. 8½ x 11 in. 16 pp. Color plates.
Home Builders' Book. 5 x 9 in. 24 pp. Color plates.

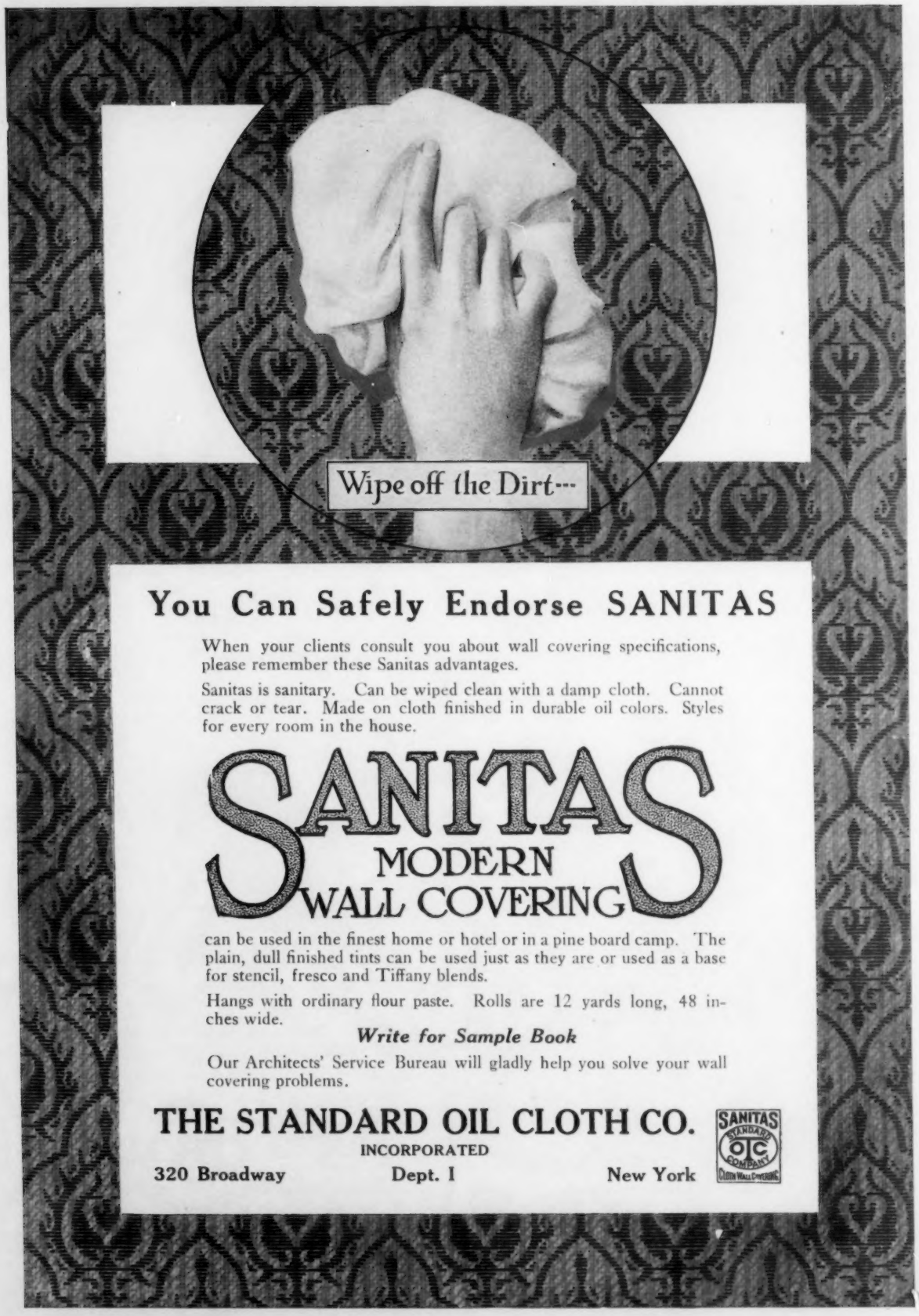
Northern Hemlock and Hardwood Mfr's Assn., 205 F. R. A. Building, Oshkosh, Wis.
Birch Interiors. Booklet. 9¼ x 12 in. 46 pp.
Beautiful Birch for Beautiful Woodwork. Leaflet. 8½ x 11½ in.
Serviceability and Qualities of Birch. Booklet. 8½ x 11 in. 7 pp.
Rules for the Inspection of Hemlock Lumber. Booklet. 3½ x 6¼ in. 32 pp.

Southern Cypress Manufacturers' Association, 1234 Hibernia Bank Building, New Orleans.
Cypress Pocket Library. Covers all uses for cypress. 41 units. 3¼ x 5½ in.

Southern Pine Association, 7093 Interstate Bank Building, New Orleans, La.
Rules for Grading Southern Yellow Pine Timbers. Treatise. 3½ x 6 in. 24 pp.
Creosoted Wood Block Floors. Booklet. 7 x 10 in. 32 pp.
Directions for Furnishing Southern Yellow Pine. Technical booklet. 7 x 10 in. 20 pp.
Manual of Standard Wood Construction. Scientific handbook. 4½ x 6½ in. 150 pp.

White Pine Bureau, 1630 Merchants Bank Building, St. Paul, Minn.
Colonial Cottages. Architectural monograph. 8½ x 11 in. 16 pp.
Farm Houses of New Netherlands. Architectural monograph. 8½ x 11 in. 16 pp.
New England Colonial Houses. Architectural monograph. 8½ x 11 in. 16 pp.
White Pine in Home Building. Booklet. 8 x 11 in. 36 pp.

Alphabetical Index of Advertisers on Page 4



You Can Safely Endorse SANITAS

When your clients consult you about wall covering specifications, please remember these Sanitas advantages.

Sanitas is sanitary. Can be wiped clean with a damp cloth. Cannot crack or tear. Made on cloth finished in durable oil colors. Styles for every room in the house.

SANITAS
MODERN WALL COVERING

can be used in the finest home or hotel or in a pine board camp. The plain, dull finished tints can be used just as they are or used as a base for stencil, fresco and Tiffany blends.

Hangs with ordinary flour paste. Rolls are 12 yards long, 48 inches wide.

Write for Sample Book

Our Architects' Service Bureau will gladly help you solve your wall covering problems.

THE STANDARD OIL CLOTH CO.
INCORPORATED
320 Broadway Dept. I New York



SHERARDUCT

Sherardized Rigid Steel Conduit

was used exclusively in the home of the Missouri Athletic Club, St. Louis.

Architect
G. F. A. Brueggeman

Cost
$1,000,000

Electrical Contractors
F. E. Newberry Electric Co

NATIONAL Products

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Flextube
Outlet Boxes
Locknuts
Bushings
Fixture Studs
Autoflex



National Metal Molding Co

Manufacturers of
Electrical Conduits & Fittings
1113 Fulton Building, PITTSBURGH, PA.

Atlanta, Boston, Buffalo, Dallas, Denver, Detroit, Chicago, Los Angeles, New York, Philadelphia, Portland, Salt Lake City, San Francisco, Seattle, St. Louis, Buenos Aires, Havana, Manila, Paris

Canadian Distributors—Canadian General Electric Company, Limited

9-21

SIMPLEX
WIRES AND CABLES

RUBBER
CAMBRIC
PAPER

SIMPLEX WIRE & CABLE Co
MANUFACTURERS
201 DEVONSHIRE ST. BOSTON
CHICAGO SAN FRANCISCO



Efficient Insulation

is the one vital requirement of underground heating from a central plant. It's secured in the Ric-wiL by double insulation of mineral composition, one of which is permanently moulded into the conduit. Other features of the

RIC-WIL METHOD

of insulating underground steam and hot water pipes

are the special drainage base which removes outside moisture and the waterproof seals which ensure permanent tightness. There is practically no repair expense. Fuel cost is lower because the pipes are not affected by outside influences. Write for free booklet.

The RIC-WIL Company
666 GUARDIAN BUILDING CLEVELAND, OHIO

BYERS PIPE



German Insurance Building, Buffalo, N.Y. Erected 1875

A 42-Year Pipe Record in one Building

MANY methods have been suggested for ascertaining the relative life of different kinds of pipe, but we know of none better than the investigation of actual service records of important old installations of pipe, where dates and facts are obtainable.

For although service conditions vary slightly, the significant fact to bear in mind is that these inequalities of conditions work out just as much in favor of one kind of pipe as another, and are averaged up so that if the evidence in nine cases out of ten points in the same direction, it must be accepted without question. The record of

BYERS GENUINE WROUGHT IRON FULL WEIGHT GUARANTEED **PIPE**

installed for plumbing and heating in the German Insurance Building in 1875, is typical of the vastly superior rust-resistance shown by old fashioned hand-puddled wrought iron pipe in thousands of installations all over the country. In these buildings Byers is invariably found in good condition after 30 to 40 years' service, while modern wrought pipe, afterwards installed under identical conditions of service in the very same buildings, or in nearby buildings, has required constant repairs and replacement.

Byers Pipe was installed in the German Insurance Building by the Iribacher Company, and Mr. J. T. Monk, who helped set the boilers back in '75, has been superintendent and engineer in charge ever since. With the exception of 70 feet of pipe in the hot return lines from the radiators, no pipe has been replaced in 42 years, and it still appears to be well preserved.

Why the Year is Rolled in Byers Pipe

To enable pipe users to determine how long any length of Byers pipe has been in service, the year of manufacture is now rolled in Byers pipe. It signifies the maker's own faith in their product, and their desire to stand on its service record, past and future. Byers—and Byers only—is thus marked. The two figures indicating the year, together with the Byers name, appear on the pipe every 3 or 4 feet.



A. M. BYERS COMPANY, ESTABLISHED 1864 PITTSBURGH, PA. LOS ANGELES NEW YORK BOSTON CHICAGO HOUSTON



Profit by their Experience

ARCHITECTS
PLUMBERS
ENGINEERS
BUILDERS

Use CAST IRON SOIL PIPE
for SOIL LINES VENT LINES
LEADER LINES WASTE LINES

No corrosion – No menace of leaking sewage and sewer gases – No tearing out of floors and walls after pipe is installed

Use CAST IRON SOIL PIPE
for HOUSE DRAINS HOUSE SEWERS

No pollution under cellars – No stoppage by tree roots – No danger of breakage by jar or settlement – No costly replacements

CAST IRON SOIL PIPE LASTS LONGER THAN THE BUILDING

IN THE BUILDING
UNDER THE GROUND

SANITATION ECONOMY PERMANENT SERVICE

A-1022

Specifications and literature will be mailed upon request by any or all of the following independent and competing makers of Cast Iron Soil Pipe and Fittings

Gadsden Pipe Co. - - - - Gadsden, Ala.	Reading Foundry & Supply Co. - Reading, Pa.	Weiskittel & Son Co., A. - - Baltimore, Md.	Bessemer Soil Pipe Co. - - Bessemer, Ala.
Haines, Jones & Cadbury Co. - Philadelphia, Pa.	Salem Brass & Iron Mfg. Co. - - Salem, N. J.	Wetter Mfg. Co., H. - - - Memphis, Tenn.	Campbell Mfg. Co. - - - - Gadsden, Ala.
Johnson Co., J. D. - - - New York, N. Y.	Sanitary Co. of America - - Linfield, Pa.	Abendroth Brothers - - Port Chester, N. Y.	Casey-Hedges Co., The - Chattanooga, Tenn.
Krupp Foundry Co. - - - Lansdale, Pa.	Somerville Iron Works - - New York, N. Y.	Alabama Pipe & Foundry Co. - Anniston, Ala.	Central Foundry Co. - - New York, N. Y.
Medina Foundry Co. - - - Medina, N. Y.	Standard Foundry Co. - - Anniston, Ala.	American Enameling Mfg. Corp. - New York, N. Y.	Charlotte Pipe & Foundry Co. - Charlotte, N. C.
National Foundry Co. of N. Y., Inc., Brooklyn, N. Y.	Superior Mfg. Co. - - - - Bessemer, Ala.	American Foundry & Pipe Co. - Penns Sta., Pa.	Coosa Pipe & Foundry Co. - Birmingham, Ala.
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Architects—Price and McLanahan, Philadelphia, Pa.
Structural Engineers—Otto H. Gentner, Jr., F. Dickson Shaw, Associated Consulting Engineers, Philadelphia, Pa.

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SAID TO BE THE LARGEST RESORT HOTEL IN THE WORLD

Contractors—Cramp & Company, Philadelphia, Pa.
Heating and Plumbing Contractor—William Anderson, Philadelphia, Pa.

Another "NATIONAL"ized Building—*(See following page)*

"NATIONAL" Pipe in Large Buildings

Hotel Traymore

ATLANTIC CITY, N. J.

¶ The Architectural and Engineering Professions have again, through representative members, given consentient proof of their recognition of the value of "NATIONAL" Pipe for installations in large buildings.

¶ The new Traymore Hotel at Atlantic City, N. J.—one of the largest resort hotels in the world—is a "NATIONAL"ized building.

¶ This great structure covers a city block, rising to a height of seventeen stories above the ground; is 150 feet wide, 500 feet long and 200 feet high, and in all cost $2,500,000.00.

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¶ When it is remembered that the Equitable Building* in New York contains 235 miles of "NATIONAL" Pipe, and other large and important buildings are "NATIONAL"ized in due proportion, it is but natural that Hotel Traymore, the country's greatest hostelry, should be "NATIONAL"ized.

¶ Complete information about "NATIONAL" Pipe may be found on pages 1218-1235 of the 1916 edition of Sweet's catalogue, or in "NATIONAL" Bulletin No. 25—"NATIONAL" PIPE IN LARGE BUILDINGS—which contains illustrations of many important buildings in which "NATIONAL" Pipe has been used. A copy of this Bulletin will be sent free to anyone whose letterhead or position would indicate a legitimate use.

¶ This is the fourth of a series of "NATIONAL"ized Buildings illustrated as follows:

THE UNION ARCADE, Pittsburgh, Pa.
American Architect, Feb. 21st, pages 60-61
Architectural Forum, March, pages 41-42
Buildings & Building Management, May, pages 23-24

*THE EQUITABLE BUILDING, New York, N. Y.
American Architect, March 21st, pages 19-20
Architectural Forum, April 1st, pages 35-36

CONTINENTAL & COMMERCIAL NATIONAL BANK BUILDING, Chicago, Ill.
American Architect, May 2nd, pages 21-22
Architectural Forum, May, pages 45-46
Buildings & Building Management, June, pages 23-24



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(See preceding page for illustration)



Cram, Goodhue & Ferguson, *Architects*

The Park Avenue Presbyterian Church
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Is Kelsey Health Heated

THE Church and adjoining Parish House are both Kelsey Heated. Because the Kelsey delivers such large volumes of agreeably heated, moisture mixed, fresh air, it heats *quickly* and abundantly ventilates while it heats.

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On the Standardization of Specifications and Publication of Practical Data—

SWARTWOUT
Rotary Ball-Bearing VENTILATOR

as built in copper with pitched top of wired glass forming a self-cleaning skylight. View from front, showing type of base recommended and louvers in open position.

(Note that no position of ventilator or louvers can obstruct the passage of light.)

Standard type of ventilator is of heavy gauge, galvanized sheet metal, with metal top.



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Key to Illustrations

1—Minneapolis Museum of Fine Arts, McKim, Mead & White, Architects.
2—Battery of Swartwouts, Quaker Oats Co., Akron. Installed after Competitive Test.
3—North East High School, Kansas City, Mo., Charles Smith, Architect.
4—Franklin Theatre, Saginaw, Mich.
5—Dairy Barn of M. C. Battles, South Euclid, O., Using Swartwout Barn Ventilator.











United States Radiators



J. C. Sunderland, *Architect* Walter E. Gillham, *Consulting Engineer* Magill Plbg. Co., *Heating Contractors*

The H. D. Lee Mercantile Building
Kansas City, Mo.

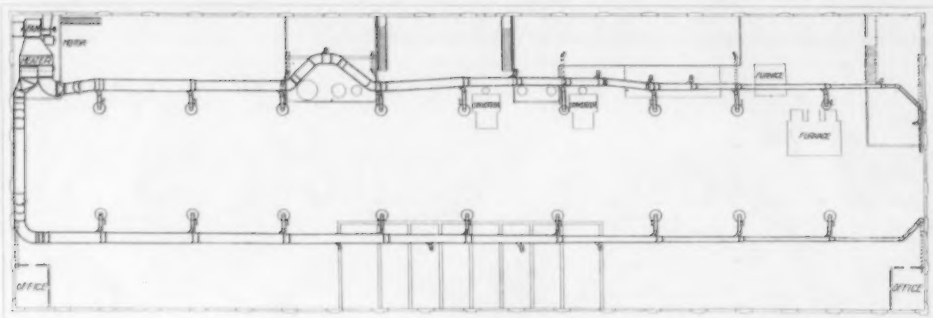
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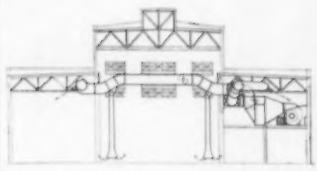
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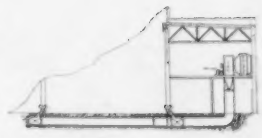
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PLAN



AT THE RIGHT IS SHOWN AN OPTIONAL ARRANGEMENT WITH UNDERGROUND DUCTS WHICH ALLOW A GOOD DISTRIBUTION OF AIR WITHOUT INTERFERING WITH CRANES OR HOISTS



CROSS-SECTION

The above is a layout for a foundry or shop. The July *Forum* will show layout in University Building

THE data given in the 28 pages of our recently issued blue print

"BULLETIN 227"

has been compiled to aid engineers and architects in preparing

Heating and Ventilating Layouts

Reference to the drawings will usually suggest ways of making any particular installation.

All the drawings refer to *actual buildings*. The systems were designed to meet the existing conditions in each individual case. The Bulletin is sent

FREE ON APPLICATION

Should additional data be required, catalogs Nos. 226, 230, 1015, 228 and 240 will furnish it — also Free.

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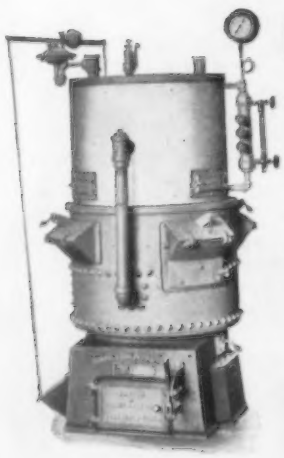
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The **Gorton Self-Feeding Boilers** are built on the lines of Power Boilers, using the same material, thus securing the greatest Strength, Durability, and highest Efficiency.

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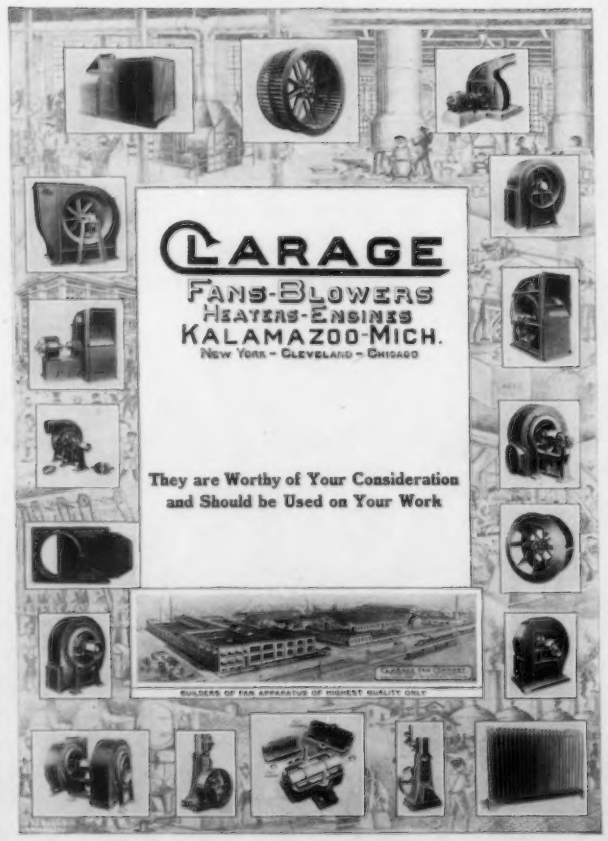
See pages 2, 3, 4, 6, 8, 10, 11, and 13 of Catalog No. 88.

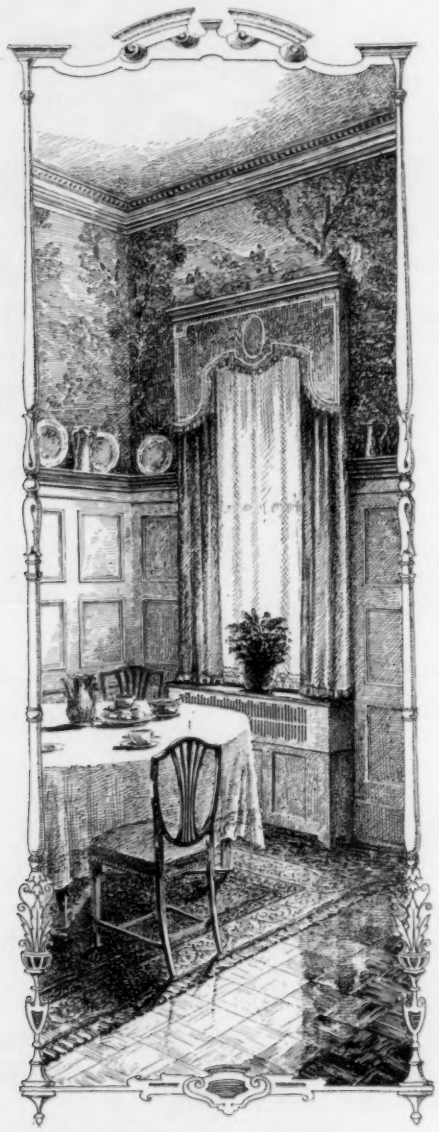
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Send for Catalogue D

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The Ja-Nar′

(SYLPHON TEMPERATURE CONTROL)



The Ja-Nar′ is a tastefully designed cabinet that fits right over the radiator. It contains a Sylphon Thermostatic heat control which automatically maintains an even room temperature and prevents overheating in any kind of weather. You simply set the Ja-Nar′ over the radiator; there is no wiring or piping, no expense to install or operate, nothing to tear out.

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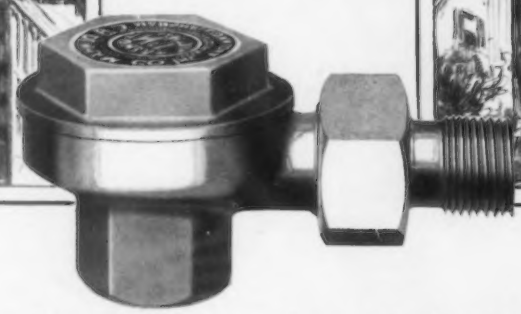
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Name and address



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VACUUM steam heating became the prevailing big-building heating many years ago, largely due to the invention of the Dunham Radiator Trap. It was this trap that made steam heating an unqualified success, for it eliminated noisy, thumping, spurting radiators, and stopped the steam loss from radiators to return lines. Then came the complete Dunham Vacuum Heating System, which is known to nearly every designer and builder of big buildings.

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CRANE—220

The Perfect Radiator Valve

Requires little or no attention after it is installed;

Cannot be jammed wide open;

Stuffing box is always tight;

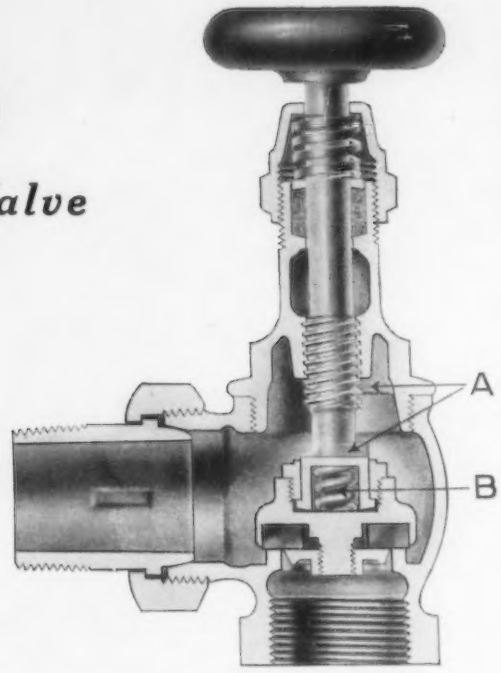
Contains three times as much packing as the ordinary radiator valve;

Shrinkage on disc automatically taken care of—hence no leakage;

Heavy and strong enough to withstand abuse;

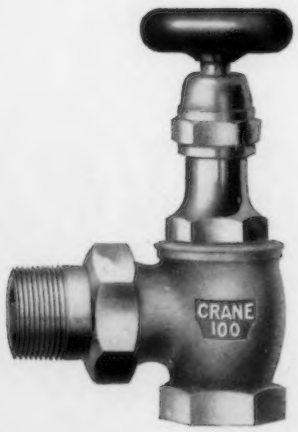
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A—Crane Patent Stop, which is a part of the center piece casting and a lug on the stem of the valve. These parts, coming in contact when the valve is wide open, prevent the jamming of the disc against the center piece.

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on single-pipe gravity systems,
on single-pipe vacuum systems,
on two-pipe gravity sysems,
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on any steam, vapor or vacuum job.

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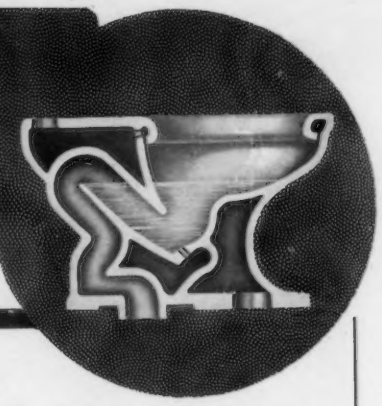
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AN improved closet with flush valve which uses only 2 or 3 gallons of water for perfect flush and refill? Or one requiring 5 to 7 gallons with uncertain action? ¶ A closet which cannot clog, because the smallest diameter is at the entrance of the trap? Or one constructed to disgust an owner forced to frequent "trouble calls"? ¶ The most efficient, economical, customer-satisfying closet is the Watrous Duojet Closet. Its distinctive principle has overcome all the wasteful disadvantages of the typical syphon-jet closet. ¶ Every architect best serves his clients by recommending fixtures which operate with the least annoyance and at a minimum of maintenance expense.

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It is not a question of affording the best. The serious water problem is—

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KOHLER WARE



"Viceroy Bath"—Plate V-14
(Patent Applied For and Name Reg. U. S. Pat. Off.)



"Bevo" Lavatory
Plate F-275-P

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Your Specifications

Should include plumbing ware for bathrooms and kitchens that will retain its attractiveness for a lifetime.

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Insure the permanent satisfaction of your client by specifying KOHLER Bath Tubs, Lavatories and Sinks. KOHLER WARE is notable for its superior quality, the beauty of the enamel, and the hygienic designs.

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NEW YORK TELEPHONE COMPANY

WHY

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"Bathrooms *of* Character"

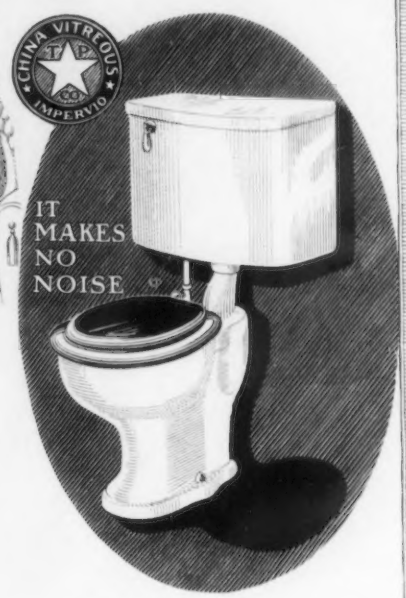
In the first place, we want you to appreciate that our products are American Premier Products in their line. The matter of cost is unimportant compared with the ultimate satisfaction to you from the possession of superior material. Always remember the labor charge, a big item of the entire cost, is the same in cheap, useless material as upon the best.

To the uninitiated, plumbing fixtures all look alike—the difference is one of years. Almost any fixture is good for a year or two, but after that you will conclude that the best is none too good.

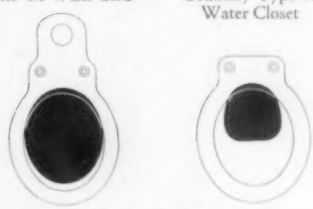
All fixtures are white. The surface glazed? Yes. *But,* The Trenton Potteries Company China Fixtures have the enamel baked on a clay body—very different from what you may get on a cheaper fixture (very little cheaper).

Clay products differ. A manufacturer who skimps the baking has a glaze that is soft. We *guarantee* our ware is subjected to heat of not less than 2400 degrees, often more. It means the hardest possible *surface* and the hardest possible ware *beneath* the surface. It means years of service after poorer made plumbing fixtures are defaced and hammered beyond recognition.

Naturally, you pay a little more for such fixtures. They cost more to produce; but your bathroom and kitchen look *so* much better.

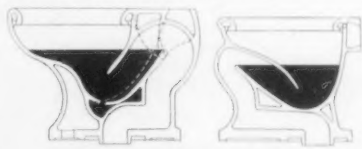


The SI-WEL-CLO — Ordinary Type of Water Closet



Water Surface
(Represented by solid black)

The fouling surface in a water closet is but one difference between a scientifically constructed bowl (the Si-wel-clo) and the ordinary type. The bowl of the Si-wel-clo is always clean and free from soil.



Seal and Water Trap-way
(Represented by solid black)

The Silent Si-wel-clo has other advantages besides its quiet operation. It has a much deeper water-seal—guard against sewer gas; a much larger trap-way, preventing stoppage; and a syphon auxiliary, which causes the closet to flush more rapidly and positively.



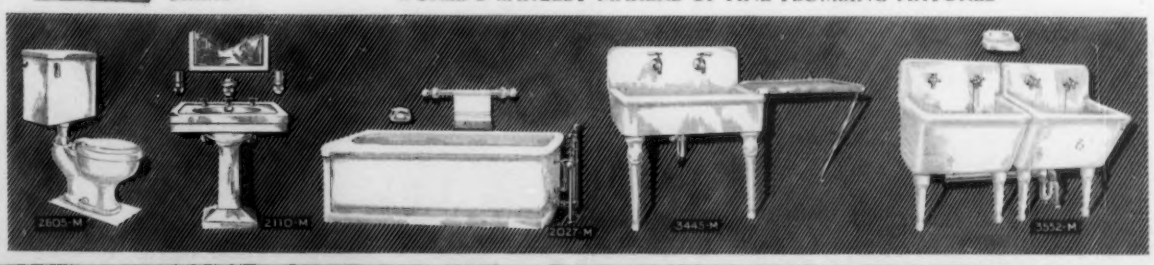
Write for our interesting and instructive booklet, "Bathrooms of Character." It shows how to plan your bathroom and arrange your fixtures. Ask for Booklet P-

It's *true home insurance* to secure The Trenton Potteries All-Clay Plumbing Fixtures. Tell any plumber you want them and look for the trade-mark stamped under the glaze.

THE TRENTON POTTERIES COMPANY

TRENTON, NEW JERSEY, U. S. A.

WORLD'S LARGEST MAKERS OF FINE PLUMBING FIXTURES



SWITCHES



An Exclusive
Mechanical Refinement

Note the straight-line, parallel-motion push button arrangement shown above. The buttons go straight in and straight out, without "wobbling." This is a clever little nicety of construction you'll find only in a "Diamond H" Switch, and it is truly typical of the care put on every detail of these high-quality house accessories. The studs and pins on which the push-button arms travel are of hardened, oil-treated, blued steel. The arms themselves are of heavy, tough brass. The bearing of the main spindle is of heavy, hard brass. The crank plate is of hardened, oil-treated, blued steel.

THE HART
MANUFACTURING COMPANY
HARTFORD, CONN.

RECEPTACLES

The G & G Telescopic Hoist
with Automatic Gear Shifting Brake Device and Silencer.

Provide for the Removal of Ashes Now!

THE ash removal problem may be solved for all times—right now by specifying a G & G Telescopic Hoist.

One man and a G & G Hoist can remove any quantity of ashes quickly, safely and quietly.



Model B Telescopic Hoist, illustrated above, raises filled can from cellar to wagon without rehandling at sidewalk level. It is equipped with G & G Automatic Gear Shifting Brake Device and Silencer, which automatically throws gears out of mesh whenever brake lever is used to lower load. This prevents hoisting handle from revolving and makes the lowering of cans simple and speedy. Silencer makes the entire operation noiseless.

When not in use, hoist telescopes and no part shows above sidewalk. The entire operation is performed from the sidewalk by one man—a protection for both public and operator against injury due to open hatch.

Booklet giving complete detailed description sent on request. Price of Model B, Telescopic Hoist,

F.O.B. Cars New York City, $185.00

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HECKSCHER BUILDING
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ARCHITECTS: JARDINE, HILL & MURDOCH

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Five Electric 1 :1 Gearless Traction Passenger Elevators.
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The Architect can specify Otis Elevators assured that the responsibility of the Otis Elevator Company extends beyond satisfactory installation. Buildings equipped with Otis Elevators enjoy the advantage of the prompt service and careful inspection rendered by any one of our one hundred offices. Such service means your client's gratitude.

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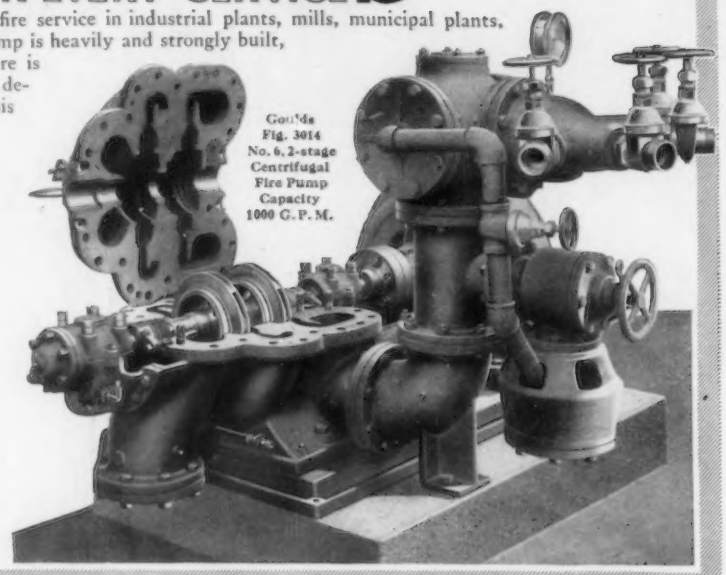
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FOR DISCHARGING DIRECT INTO HOSE LINES OR FOR SERVICE WITH AUTOMATIC SPRINKLER SYSTEMS

This is a type of **GOULDS PUMPS** FOR EVERY SERVICE

which has met with great favor for fire service in industrial plants, mills, municipal plants, office and hotel buildings. While the pump is heavily and strongly built, the design is extremely simple. There is nothing to get out of order and cause delay when the pump is needed. This type of pump, is built in accordance with the Fire Underwriters specifications and has been fully approved by them.

Furnished for capacities from 500 to 1500 G. P. M. for total heads up to 150 pounds. They can be supplied for direct connection to either electric motors or steam turbines.



Gould's Fig. 3014 No. 6, 2-stage Centrifugal Fire Pump Capacity 1000 G. P. M.

Our Bulletin 118 contains complete data

THE GOULDS MFG. CO.

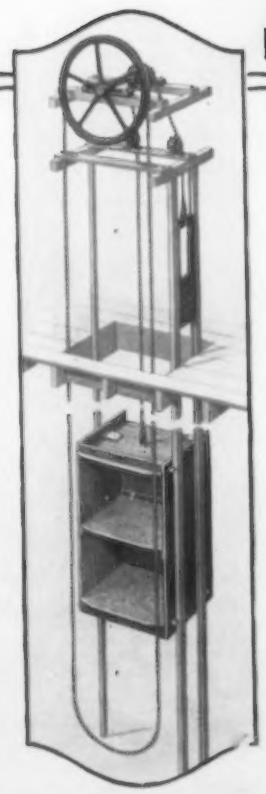
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A Platform with a Single Plank

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"Sedgwick Dumb Waiter Machines are guaranteed for five years from date of purchase and will be repaired free of charge at any time within that period if returned to the factory, charges prepaid."

Upon this platform we stand unequivocally.

To the user this means guaranteed satisfaction of the machine's operation at no cost except the original outlay.

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Hand Power Elevators and Dumbwaiters Exclusively



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The Largest Elementary School in the World Is Completely Equipped with

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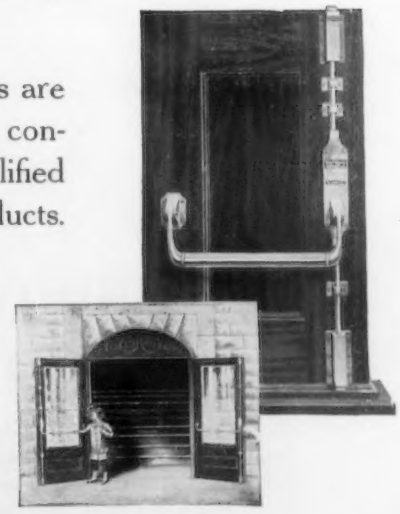
Trade Mark Reg. 85021 *Pat. U. S. & Can.*

Self-Releasing Fire Exit Latches

Just another example of the dominance of **Von Duprin** Devices.

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See "Sweet's" or ask for Catalog 12-F

Vonnegut Hardware Co., Indianapolis, Ind.

Manufacturers and Distributors



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Standardization and simplification in sash-pulley production mean a better product at a fairer cost. The advantage is yours and your clients'.

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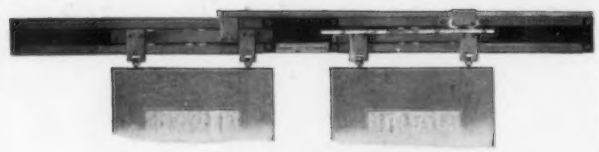
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Avoid High Maintenance Cost

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Telescoping steel tracks, with steel balls between, are the prime features of the hangers. Note illustration.

Simplicity of design, certain and easy operation, with Quality of Material used, practically insure no cost for maintenance, or so slight a cost at most that their installation proves a *positive saving*, as against those of the *cheaper* sort.

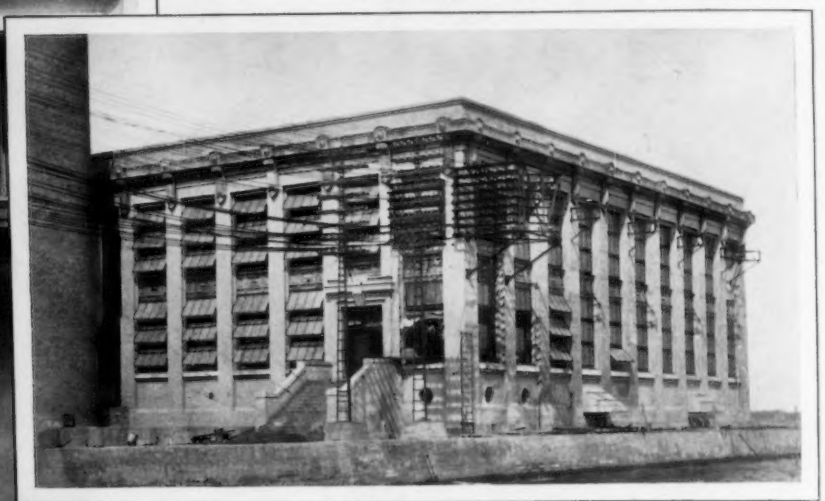
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Power House, Charleston, South Carolina
Architects, Harris & Richards, Philadelphia, Pa.



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Hollow Metal Products

The close proximity of this power house at Charleston, S. C., to the water's edge, doubtless was one of the considerations which actuated the architects in specifying so high a quality product for a building of this character.

Inherent in Dahlstrom Products are those qualities and procedures of manufacture which anticipate service out-of-the-ordinary under variable climatic conditions or exposure to moisture.

Dahlstrom Products thus become permanent factors of utility and fire-safety.

Dahlstrom Literature describes rather than advertises. Write for Catalog.

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Dahlstrom Metallic Door Co.

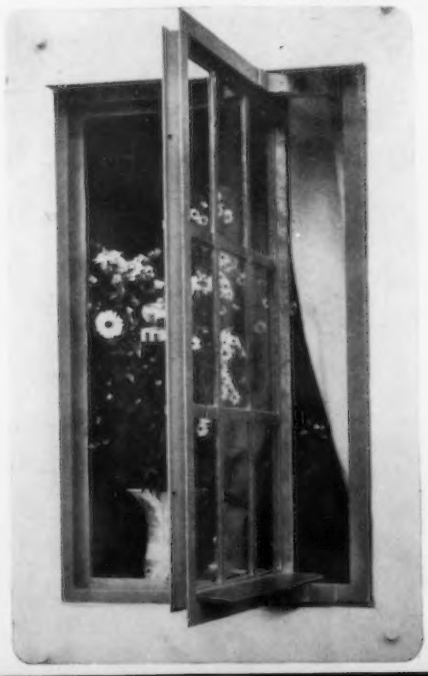
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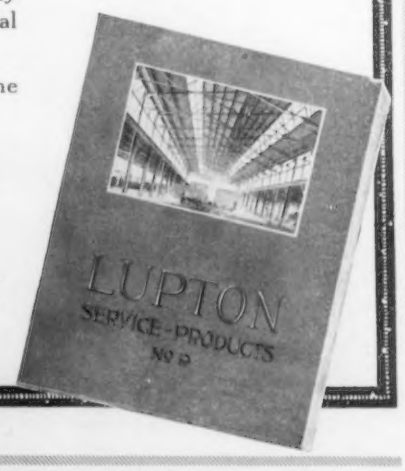
LUPTON STEEL PARTITION

is made in solid and door units of standard width and of certain standard heights. These units may be enterchanged at will.

A door may be moved, another set in, an entire line of partition taken down and re-erected, without injury to either partition or building. The glass need not be removed from setting.

Lupton Steel Partition has formed steel mullions, concealed base standards, plate panels and large glass lights. Its dignity and character befit the highest class of office and industrial buildings.

Lupton Steel Partition and Doors are fully described in the No. 9 Catalogue. Have you received your copy yet?



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LUPTON PRODUCTS

Lupton Steel Sash
- Pivoted Factory Type
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Lupton Rolled Steel Skylight
Lupton Steel Partitions and Doors
Pond Continuous Sash for Pond Truss, saw-tooths, monitors and side walls
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Dime Savings Bank, Brooklyn, N. Y. Architects, Mowbray & Uffinger

IN these days of high rentals, space is valuable, especially so in thickly populated districts. You can increase the rental income of the buildings you plan by specifying

BERGER'S Raydiant

Sidewalk Lights, which will flood otherwise dark basements with an abundance of bright daylight.

The Lazalite Glass, used exclusively in this system, gives maximum illumination and a scientific distribution of the light rays.

The double reinforced construction gives remarkable strength, and the interlocking steel forms provide easy and speedy installation.

The Easy Replace feature assures permanency, as it permits broken glass to be easily replaced in a practical and watertight manner.

See 1917 Sweet's, pages 834-837, and write for Technical Catalog T. F.

Berger's Pressed Steel Cores

For Light Weight, Fireproof Floor Construction

BY their use a series of "T" beams is formed, requiring 40% to 60% less concrete than a solid slab. This reduction of dead load by the elimination of inert concrete also means a reduction in the sizes of girders, columns, footings and walls, and a saving in reinforcing bars for all parts of the structure.

Berger's Pressed Steel Cores are strong, rigid and economical, the economy being greatest when the distance between supporting beams is from 15 to 35 feet, and the live loads to be carried are less than 200 pounds per square foot.

Easily and quickly erected with minimum form work and centering.

See 1917 Sweet's, page 195

The Berger Manufacturing Co., Canton, O.

Branches: Boston New York Philadelphia Chicago St. Louis Minneapolis San Francisco Los Angeles
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Junius Hotel, Chicago, Ill. Architect, Henry K. Holsman

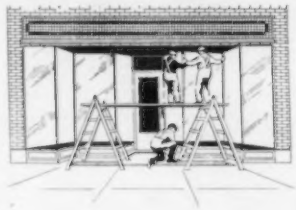
Desco METAL STORE FRONTS

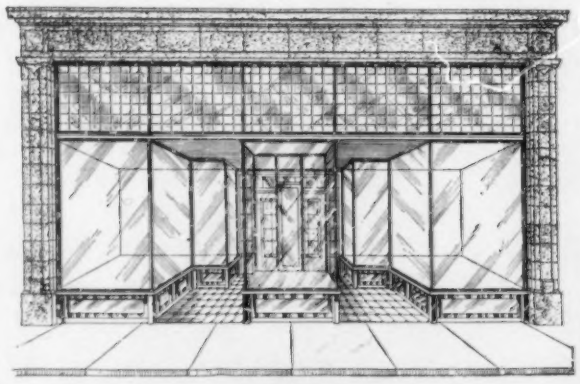
Remodeled Store Fronts

Every retailer wants a new front — competition demands it. Architects look upon this wide-spread movement of new store fronts with keen interest, for it opens up a broad field for expansion. "Desco" is meeting with universal favor for many reasons, primarily its unusual simplicity and moderate cost. We are ready to prove its superiority to you and will also gladly send prices upon request.

See details in Sweet's Catalog

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BROKEN GLASS? — NO

You have used copper store front construction and have had trouble with broken glass.

USE ZOURI KEY-SET

the only modern construction and you will avoid all trouble.

Zouri Drawn Metals Company

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THE ARCHITECT, specifying the material of **Kawneer Store Front Construction,** is well aware of the merits which are characteristic for this construction.

Its pleasing architectural lines, the simplicity of its construction, together with the resilient glass gripping members of the otherwise sturdy construction, makes this a very desirable store front construction.

It is permanent, too—it lasts a lifetime; as long as the building itself.

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ESTABLISHED 1876

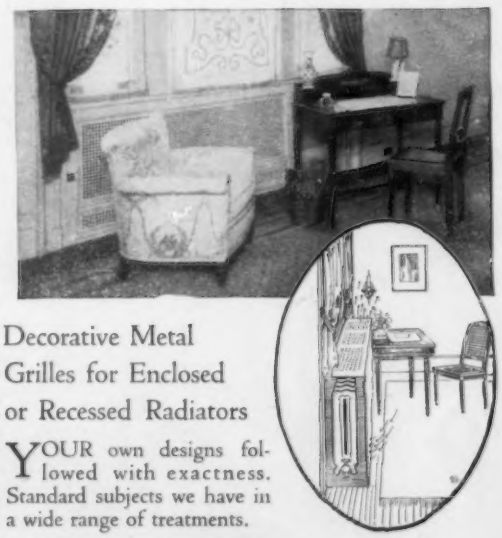
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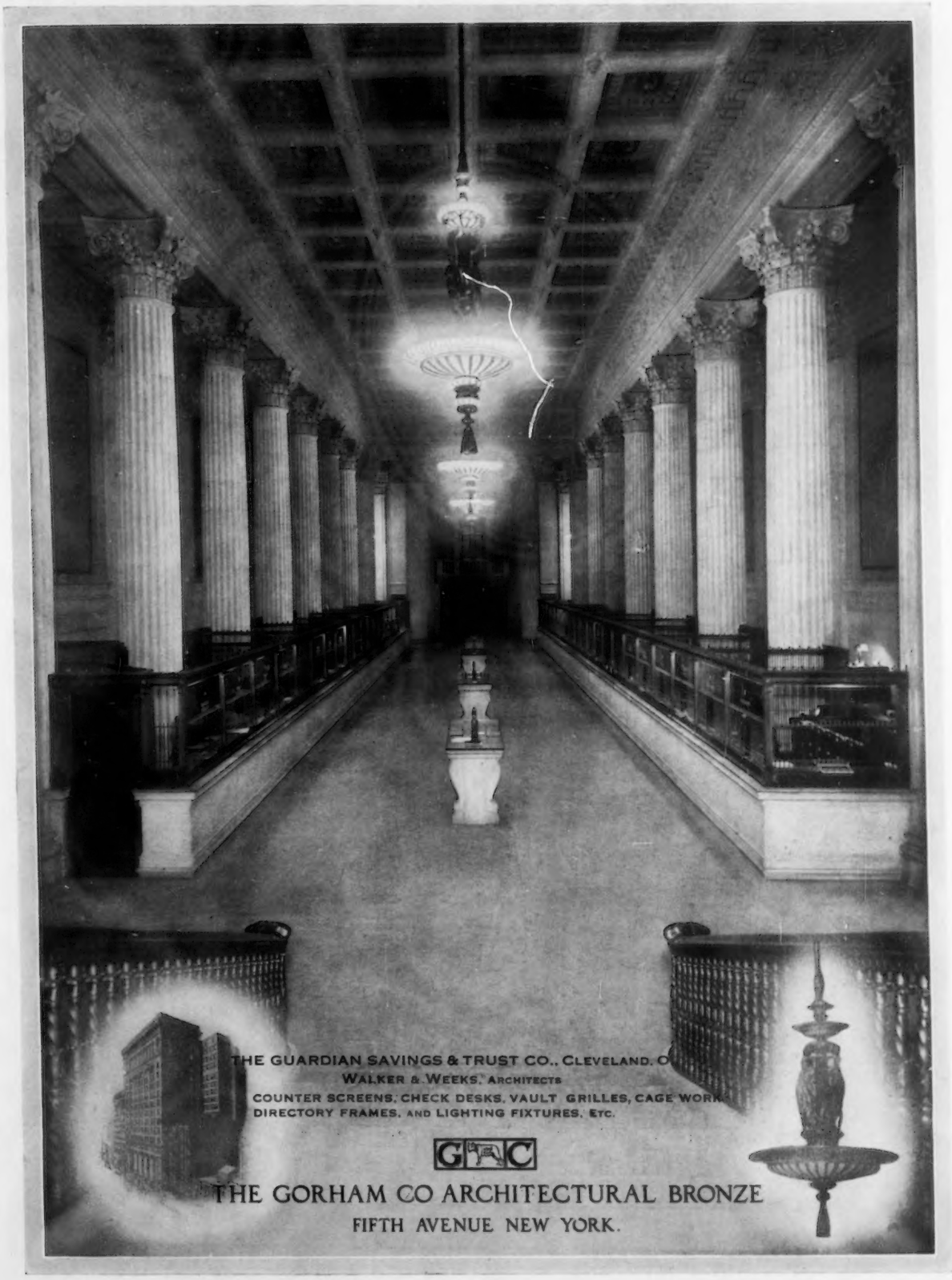
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Grilles for Enclosed
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Suggestions for meeting your problems gladly made. Of our hearty co-operation, you are assured.

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THE GORHAM CO ARCHITECTURAL BRONZE
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the real accomplishments of

Hydrated LIME PLASTER

You Have Read

of the effect of plaster upon the acoustics of Churches, Theaters and Auditoriums, but you may not know the *especial* advantages of "Hydrated Lime Plaster" over other plasters. These we *want* you to know—why, too, it *is* the best and why the enlightened demand it for every contract where acoustics or quiet conditions are important considerations.

Write for full information to-day.

In sending the desired data we will include "Pamphlet E"—"Standard Specifications for Hydrated Lime Plastering"—a pamphlet that should be in every architect's file.

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are the inevitable outcome of the use of Hydrated Lime Plaster. In drying, millions of tiny dead air cells are formed, concerning which acoustical authorities state that a wall of this character will absorb more sound than a hard, dense surface.

Hydrated Lime Plaster not only improves the acoustics within the auditorium proper, but also excludes noise from adjoining sections of the building.

Hydrated Lime Plaster contains no injurious chemical elements which may induce disintegration of the wall structure and the paints or finishes used in its decoration.

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No. 170. Scale, ¾"=1'0" Base, 2'2½" square. 7'7" high to bottom of globe

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More than 300 models listed in our several catalogues afford a wide range for selection of design and facilitate quick delivery. We also execute with precision and despatch work from special designs.

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has been the standard quality roofing plate for the last quarter of a century. When properly applied it makes a light, clean, sanitary roof which is a thorough protection from fire and storm.

Copper Bearing Base
Very Heavy Coating *Palm Oil Process*

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GENERAL SLATE COMPANY

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The recent Atlanta conflagration gives interest to this picture



Why put kindling wood on the roof of any house costing over $7,500

BANGOR FIRE of 1911. Everywhere stopped by SLATE ROOFS

The Sign of Superiority

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Look for the Keystone added to brand

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The added durability and service of these products has been fully substantiated by the most exacting service tests, also by actual experience of buyers and users. We unhesitatingly recommend *Keystone* quality as superior to any other products on the market. Keystone Copper Steel Roofing Tin insures lasting satisfaction. Our latest booklet "Facts" is of interest to architects and users of sheet metal products.

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The ARISTOCRAT *of* BUILDING MATERIALS

Volume 4 Is In Print!

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This book, Volume 4 of the Indiana Limestone Library, will be a welcome addition to the files of every architect, if we are to judge by their reception of Volume 1 which was written in the same conservative vein.

The present volume treats of the especial adaptability of Indiana Limestone to the Bank Building and contains, besides a very useful collection of photographs, a long list of banks built of "The Aristocrat of Building Materials" classified by States (Provinces in Canada) and cities or towns. You will find this list of value for your own reference or in case you wish to refer a client to an actual Indiana Limestone bank building—doubtless the best way of exhibiting the material.

The text of the volume is addressed to the lay reader but nevertheless will be found to contain points of importance to the profession.

Volume 4 FREE on request

Indiana Limestone Quarrymen's Association

P. O. Box 505, BEDFORD, INDIANA

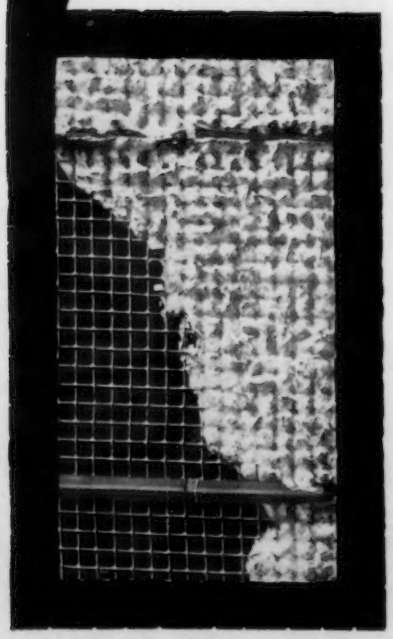


PREPAREDNESS!

In the building of a house nothing is more important than the preparation for the plaster. Wright Wire Lath used as the plaster support, inside and out, will assure a wall permanency that will satisfy the owner and add to the reputation of the builder and architect.

Wright Wire Lath is a woven fabric of cold-drawn steel wires. Each individual strand is a finished product in itself. It has great strength, durability and rigidity, and the strong, even selvage renders it easily handled and tied together.

The illustration below shows how the plaster keys on to the lath — a knobbed key to every mesh. The lath is thus embedded in the plaster away from all possible dampness.



WRIGHT WIRE LATH

is fire-resisting in the extreme. Ceilings won't sag from the action of fire and water. If fire starts in a room lathed with Wright Wire, it stops where it starts. Can be attached to iron or wood furring. Can be worked around all shaped spaces and permits all manner of architectural treatment.

Wright Wire Lath is made in three styles, — plain steel, japanned and galvanized.

Our interesting booklet L describes quite at length Wright Wire Lath. It should be in the hands of every architect, builder, prospective home owner and everybody else interested. It is free — write for it.

WRIGHT WIRE COMPANY
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Slee & Bryson, Architects

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Greater versatility in stucco

Stucco has been used successfully for a wide range of constructions and treatment: from bungalows and small garages to country houses and massive railway stations, in Moorish, English half-timbered, Colonial and other styles.

Now, in addition, there has been developed a stucco with great variety of color, tone and texture — stucco that is variegated with colored marble or granite screenings and tinted sands; stucco with life, warmth, character and interest.

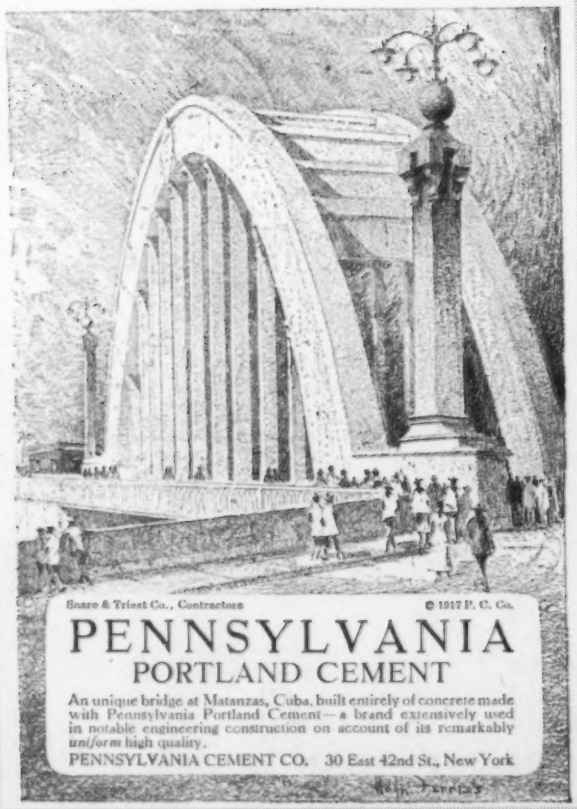
Our monograph "Color Tones in Stucco" reproduces specimen panels in full scale and color, with formulas, and contains specifications for color stucco. Send for your copy of this monograph.

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ATLAS-WHITE



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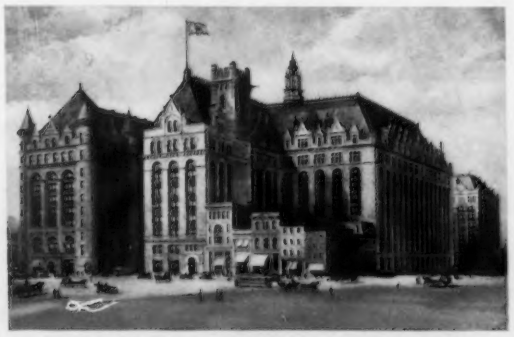
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An unique bridge at Matanzas, Cuba, built entirely of concrete made with Pennsylvania Portland Cement—a brand extensively used in notable engineering construction on account of its remarkably *uniform* high quality.

PENNSYLVANIA CEMENT CO. 30 East 42nd St., New York

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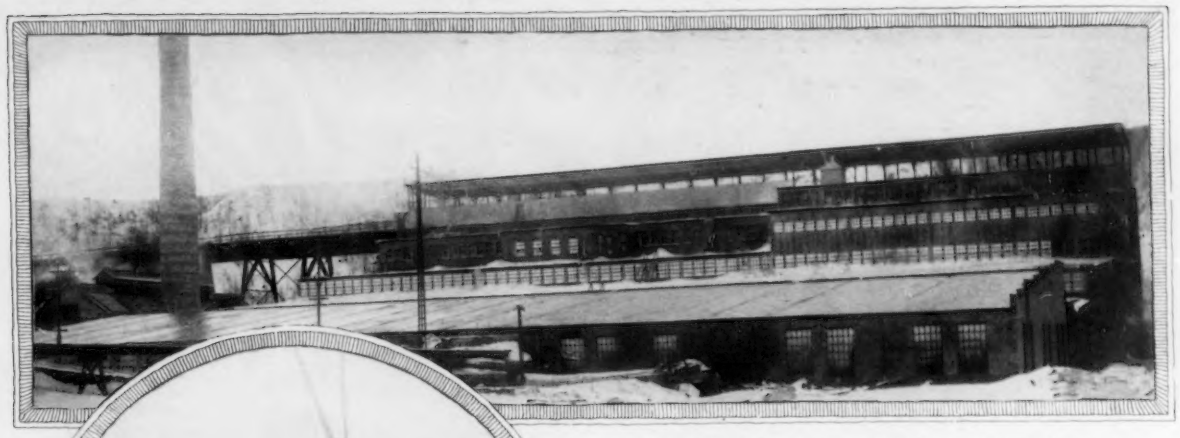
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Boston Cleveland Chicago Detroit Louisville, Ky. Philadelphia Washington



Baltic Mining Company Stamp Mill, Freda, Michigan, designed by Copper Range Company, Engineering Department



Columbus Sewage Disposal Plant, Columbus, Ohio. Consulting Engineer, J. J Morgan

Specify Self-Sentering For All Concrete Work

Here are two interesting Self-Sentering jobs. The larger picture is a photograph of the Stamp Mill of the Baltic Mining Company, Freda, Michigan. The roof is of concrete reinforced by Self-Sentering.

The second photograph shows a sewage disposal plant at Columbus, Ohio. Self-Sentering played a prominent part in its construction.

These two widely contrasted installations suggest the adaptability of Self-Sentering. It can be used profitably wherever concrete is used.

SELF-SENTERING

Self-Sentering is a combined reinforcing and centering—a one-piece steel lath and stud—now used for concrete roofs, floors, ceilings, curtain walls, solid partitions, columns and beam protection in many modern factories, office buildings, warehouses, machine shops, general mercantile buildings, farm buildings, garages, elevator and air shafts.

It can be adapted to any type of roof—pitched, dome, monitor, saw-toothed or flat.

In wood frame buildings of all descriptions, Self-Sentering walls, floors, roofs and ceilings act as effective fire stops, checking flames before they can reach the wood.

Self-Sentering plays an important part in the fireproofing of steel columns and beams. It eliminates costly false work in the construction of concrete steps, stairs and seat risers. It acts both as lath and furring for suspended ceilings.

Self-Sentering bends easily to curved or irregular forms. For that reason it can be utilized as form and reinforcing for arched floor or roof slabs, silos, tanks, conduits, culverts, fences and railings.

Exacting fire tests have proved that a slab of concrete and Self-Sentering resists stubbornly the hottest fires. This type of construction also withstands the ravages of time, moisture and decay.

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Self-Sentering, gage for gage, has a greater sectional area than any similar material. It makes a light weight, yet extremely substantial and durable roof, floor or wall which lasts practically forever without need of repair or upkeep.

The *"GF Fireproofing Handbook"* contains complete information about Self-Sentering in a form which makes it most valuable for the engineer, architect or contractor. Sent free upon request.

The General Fireproofing Company - - Youngstown, Ohio

GF YOUNGSTOWN OHIO

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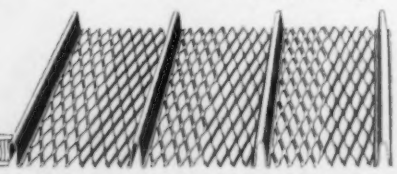
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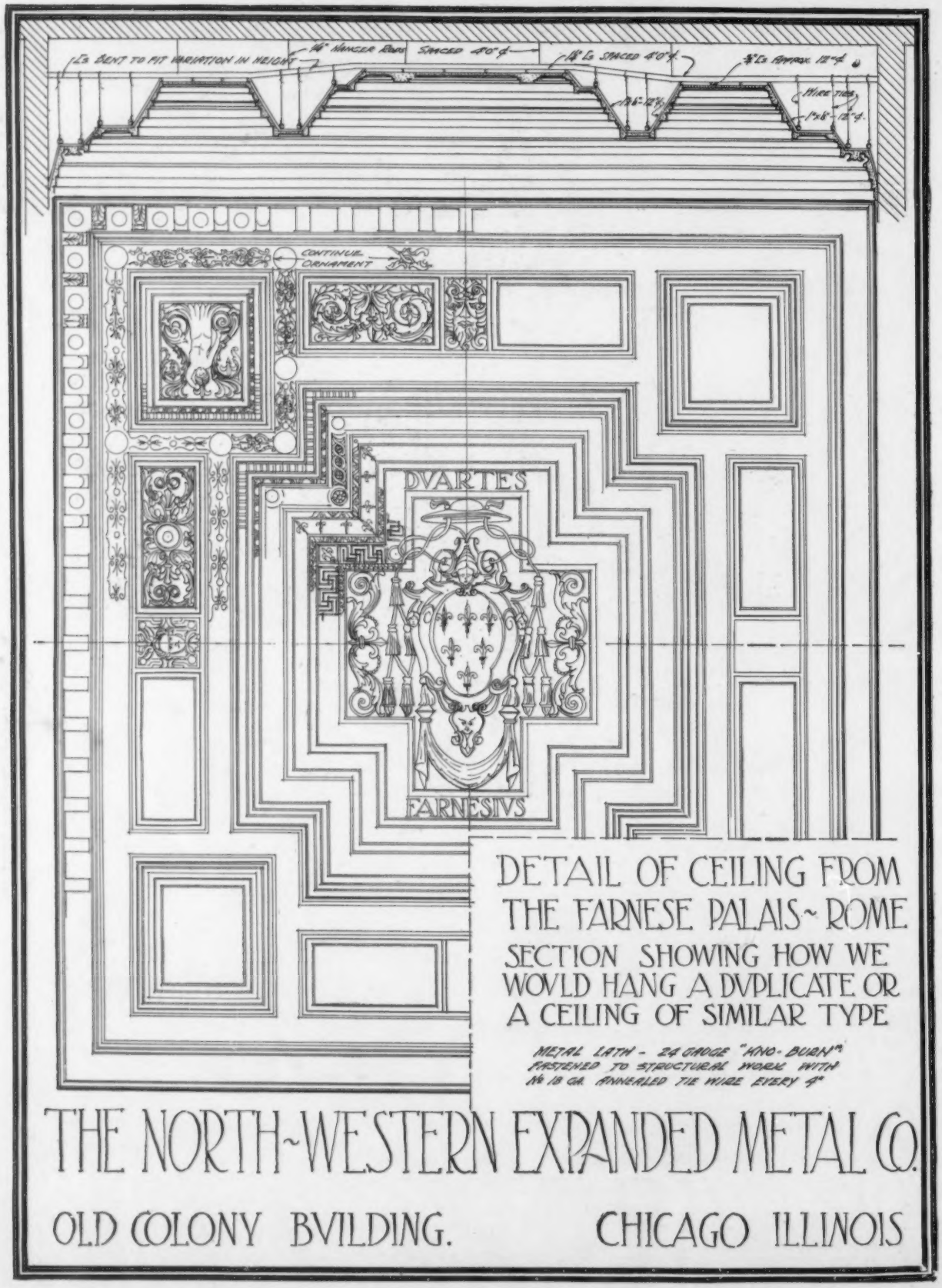
Members of Associated Metal Lath Manufacturers

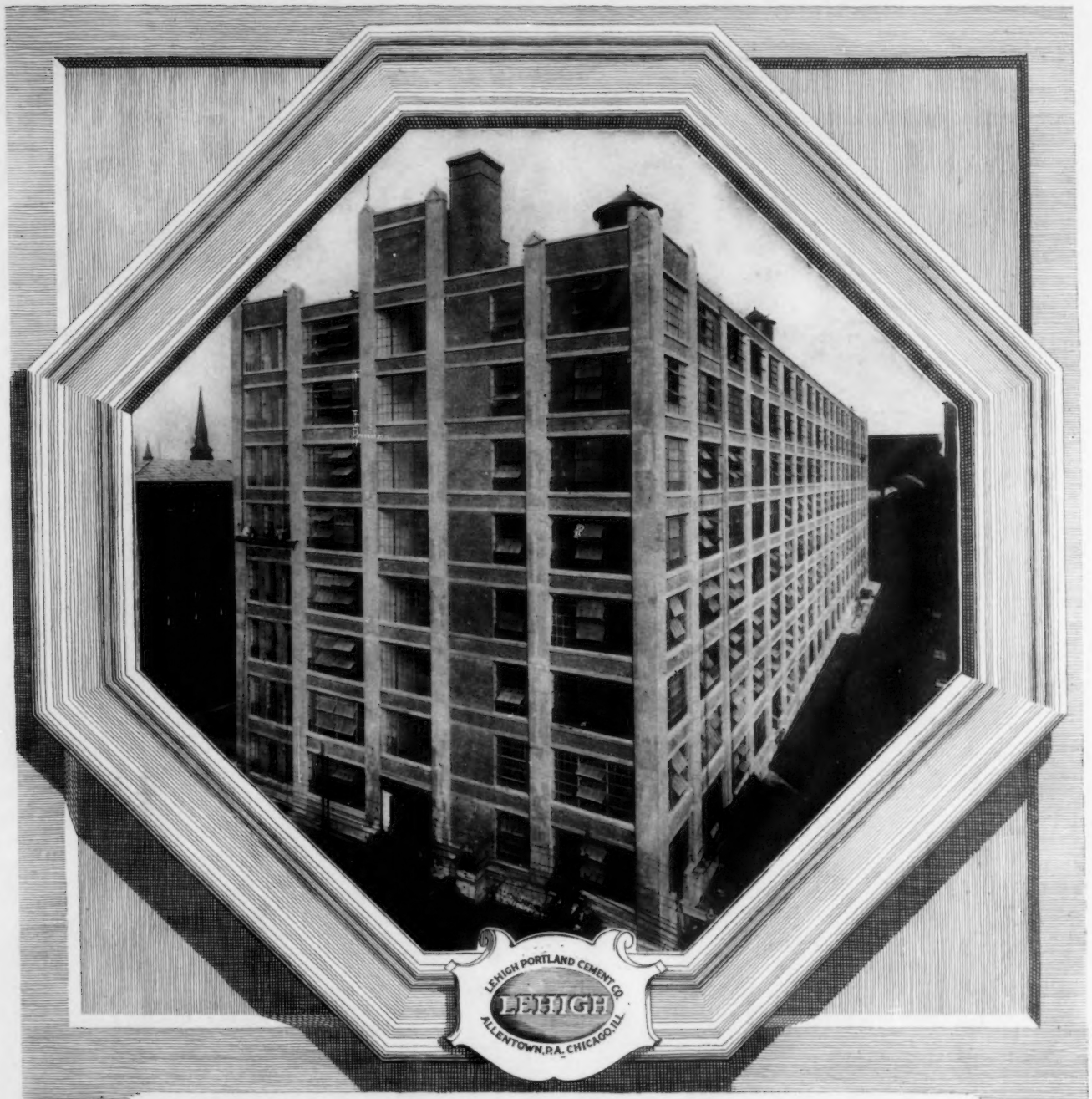
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THE MASTER BUILDERS CO.

Makers of Master Builders Concrete Hardner, Master Builders Red Concrete Hardner, Master Builders Black Concrete Hardner, Roadyte, Concrete Hardner for Concrete Roads, Master Builders Sani-seal — Liquid Concrete Hardner.

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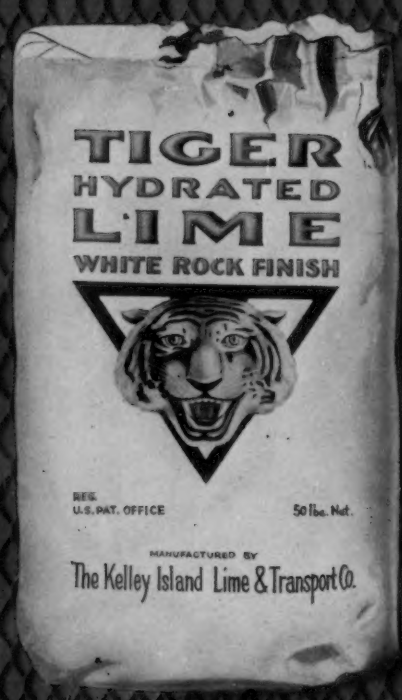


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Architects find it most desirable for interior embellishment. Write us concerning it.

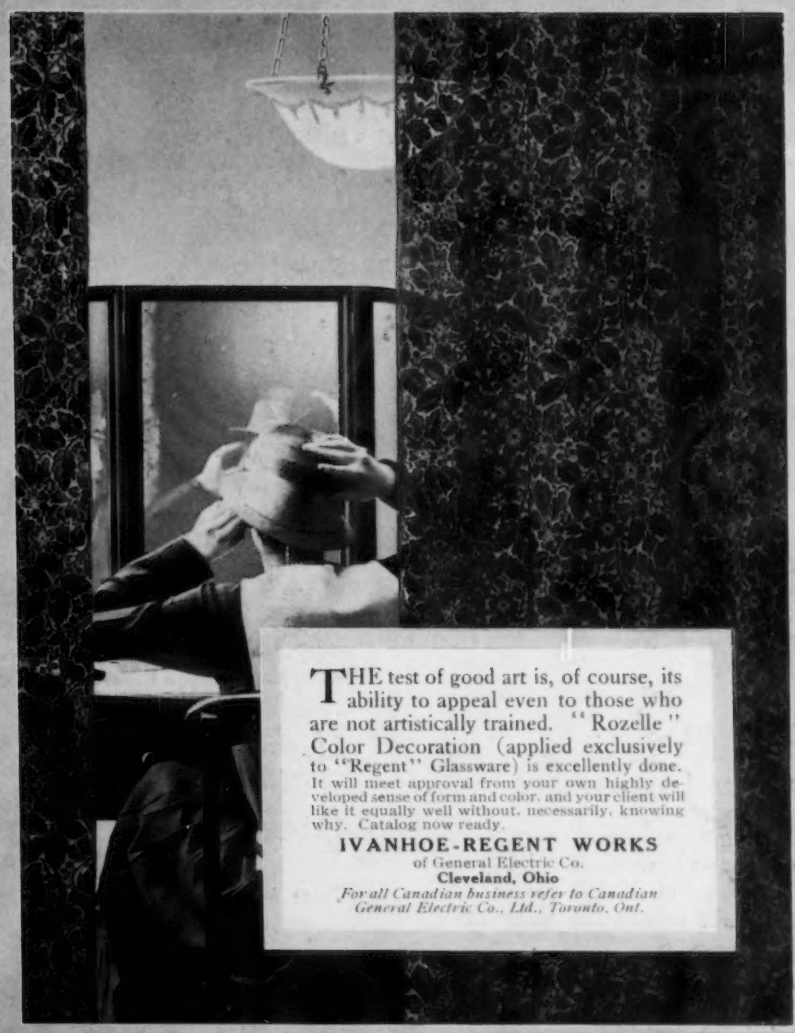
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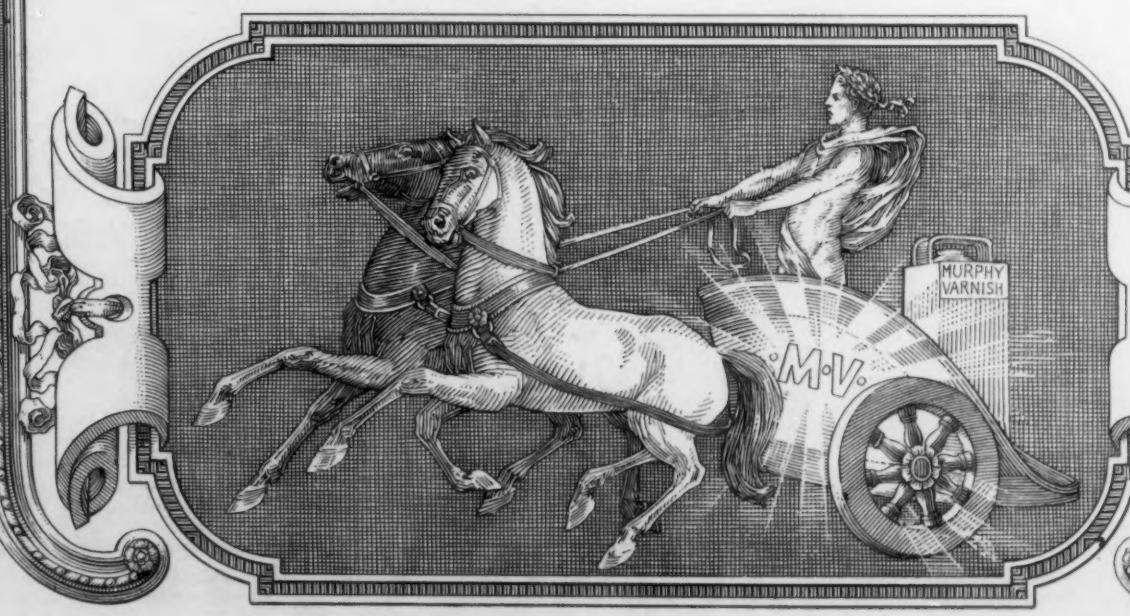
Murphy Varnish Company

Franklin Murphy, jr., President

Newark, New Jersey Chicago, Illinois

Dougall Varnish Co., Ltd., Montreal, Canadian Associate

ANA



The Atmosphere of Your Interiors

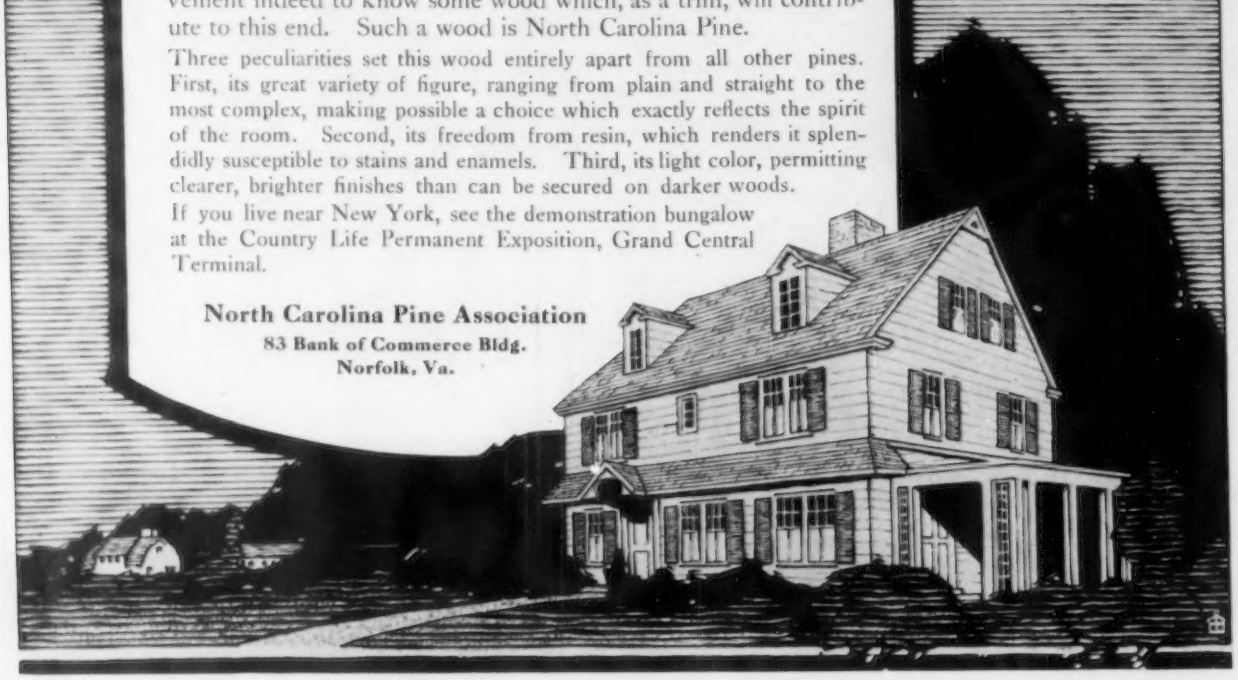
When an interior must express a certain atmosphere it is convenient indeed to know some wood which, as a trim, will contribute to this end. Such a wood is North Carolina Pine.

Three peculiarities set this wood entirely apart from all other pines. First, its great variety of figure, ranging from plain and straight to the most complex, making possible a choice which exactly reflects the spirit of the room. Second, its freedom from resin, which renders it splendidly susceptible to stains and enamels. Third, its light color, permitting clearer, brighter finishes than can be secured on darker woods.

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North Carolina Pine Association
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North Carolina Pine





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The best cedar in the world for pencil purposes comes from our Southern States, more particularly Florida, Georgia, Alabama and Tennessee. The necessary qualities of cedar wood for pencils are *softness and a straight grain.* The supply of this cedar (Juniperus Virginiana) is fast becoming exhausted. Only *the best of this wood* is used for

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In 16 accurately graded degrees—6B softest to 8H hardest
Hexagon—Yellow Polish
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At All Stationers
EBERHARD FABER : : : NEW YORK
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Architect, G. C. Burroughs, Cincinnati, O., for Gilbert K[illegible]per

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Cincinnati Golf Club House — Architects, Elzner & Anderson

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Bishopric Board *can't sag* and crack the stucco. The fibre-board, Asphalt Mastic and creosoted lath give absolute protection against heat and cold, wind and weather. They form a construction that is water-proof, vermin-proof and sound-proof.

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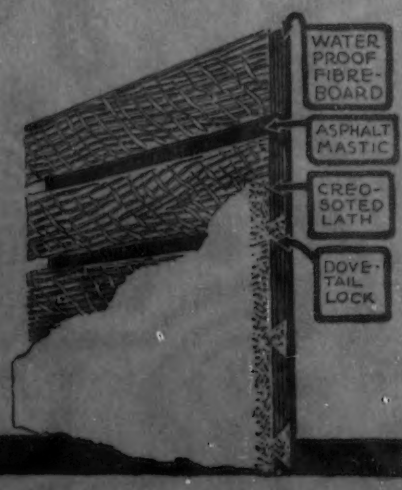
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